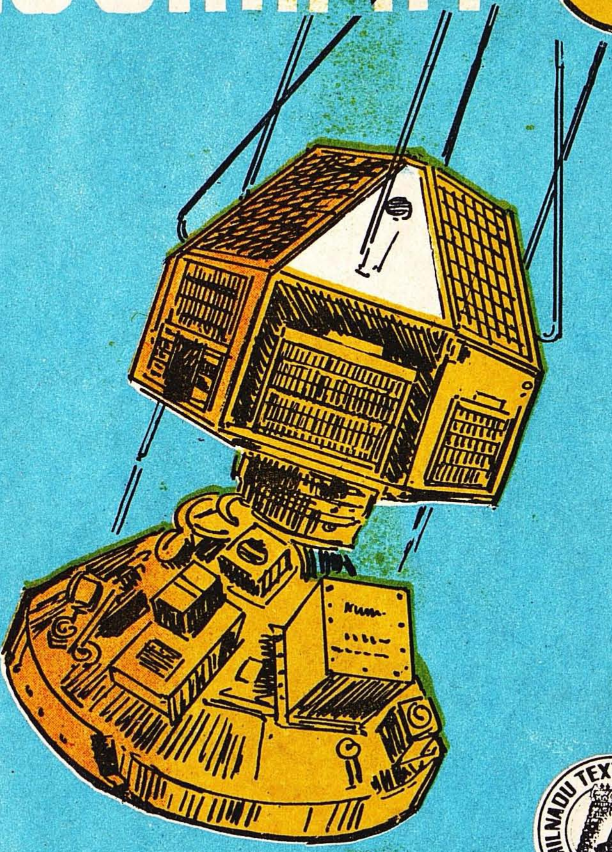
GEOGRAPHY 6



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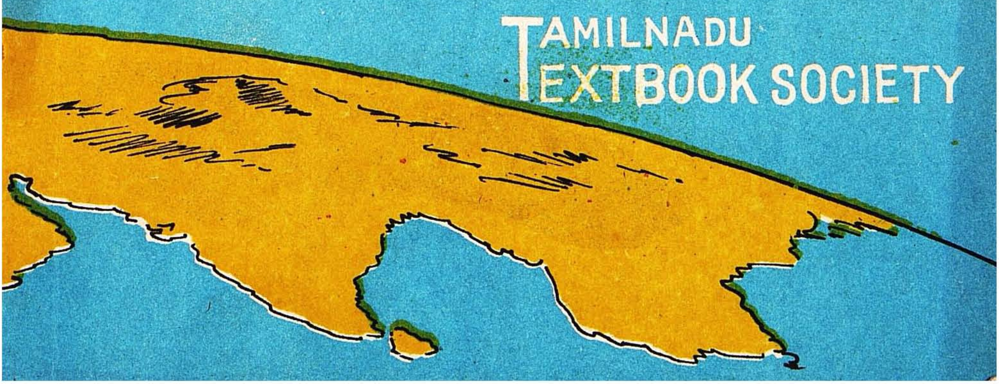

GEOGRAPHY

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(A) PHYSICAL GEOGRAPHY

1. THE ATMOSPHERE—ITS STRUCTURE AND COMPOSITION

The vast expanse of air which envelopes the earth all round is known as the *atmosphere.* It extends upto a height of 320 km. from the earth's surface. It is colourless. It consists of gases such as nitrogen, oxygen, carbon-dioxide, ammonia, argon, neon, water-vapour and dust. Of these, nitrogen constitutes 78% and oxygen 21%.

The density of air in the atmosphere is larger in quantity near the earth and the density decreases as we go to higher altitudes. That is why the ratio of the composition of the gases also decreases while we ascend higher and higher. Mountaineers and Astronauts carry oxygen-cylinders with them as the quantity of oxygen decreases as they ascend higher and higher. This oxygen in the atmosphere helps burning and breathing.

The earth has atmosphere to protect it from the hot rays of the sun. The atmosphere absorbs and reduces the intensity of the hot rays of the sun. So things on earth are not burnt up by the sun's rays. Meteors falling down on the earth are burnt and destroyed due to their friction with the air. Otherwise they will cause destruction to the earth.

We cannot see the air in the atmosphere but do feel it. For example, if a piece of paper is thrown,

it does not reach the ground at once. Its downward motion is checked by air. Air has weight. It is also compressible. For example we can pump in air into a cycle tube much above its capacity. Its weight also increases. But we cannot pump in water into the tube likewise, as we know that the tube can hold only a fixed volume. If we boil a pot of water, the water changes into vapour and mixes with the air. Similarly the water found on the earth changes into vapour due to the temperature of the sun and mixes with the atmosphere. This water vapour is one of the factors that determines the weather and climate of a place. In the lower strata of the atmosphere, the water vapour becomes clouds and causes rainfall. The atmosphere contains full of dust particles; when the sun's rays fall into a room through the window or hole, we can see dust particles in them. The water vapour in the air cools and condenses around the floating dust particles in the air and forms *mist* and *fog*.

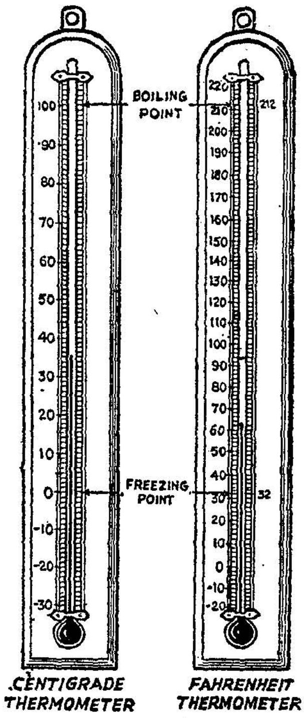

Fig. 1. Thermometers

Temperature

The earth receives heat from the sun. This heat determines the climatic conditions of a place. The dwellings, food and dress habits of men are determined by climate. The temperature of a place is really the

temperature of the air at that place. We measure this temperature by means of an instrument called the *Thermometer*. The freezing point of water is taken as 0°C and its boiling point as 100°C. The temperature of a certain place for a day is calculated by adding the highest and the lowest temperatures recorded there for that day and dividing the total by two. It is the average temperature of that day. The *daily range of temperature* of a place is the difference between the highest and the lowest temperatures of a day.

We learnt that the earth gets the heat from the rays of the sun. The temperature of a place is determined by the angle at which the rays of the sun strike the surface and the length of day time at that place.

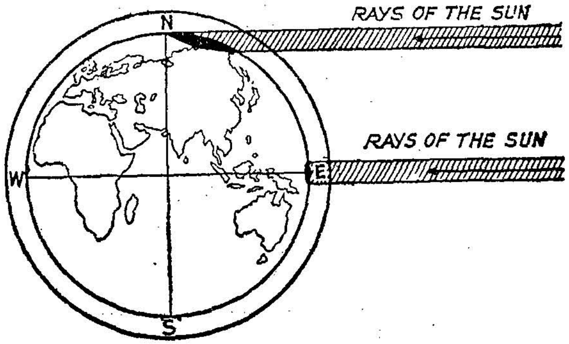

Fig. 2. Vertical and slanting Rays of the Sun

The vertical rays of the sun heat a smaller area and so the heat of the vertical rays is more. This is the reason why a place in the equatorial region is very hot. When we go from the equator towards the polar regions, the temperature decreases, because the rays of the sun fall slantingly. The slanting rays of the sun have to pass

a longer distance in the atmosphere and they strike a larger area of the earth's surface. So the heat is less. Look at the diagram (Fig. 2.) showing the vertical and slanting rays of the sun.

Look at the diagram showing the Temperature Zones. Based on the temperature of the air, we can divide the earth into three zones. (1) The belt that lies between the Tropic of Cancer (23½° N) and the Tropic of Capricorn (23½° S) is known as the *Torrid Zone* (Tropical Zone). (2) The belts that lie between

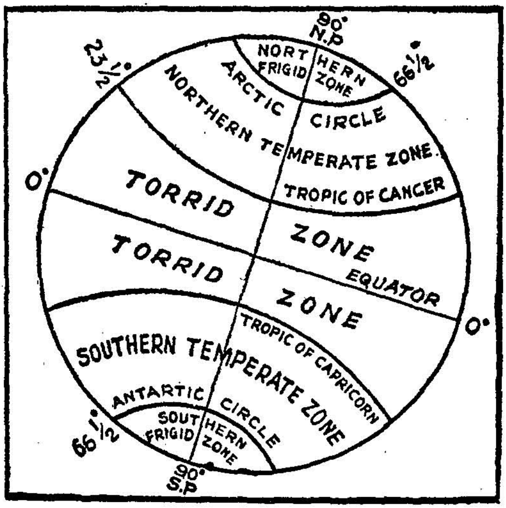

Fig. 3. Temperature zones

(a) the Tropic of Cancer and the Arctic Circle (66½° N) in the northern hemisphere and (b) the Tropic of Capricorn and the Antarctic Circle (66½° S) in the southern hemisphere are known as the *Temperate Zones.* (3) The regions enclosed in the north by the Arctic circle and in the south by the Antarctic Circle are known as the *Frigid Zones.*

The temperature of a place, depends on its latitude (i.e), its distance from the equator, its distance from the sea-coast and its altitude above the sea-level, wind and rainfall. As we go either north or south away from the equator towards the poles, the temperature decreases. For example, the temperature in London, the Capital of England, is lesser than the temperature of Madras. The reason is, London is far away (51°. 30' N) from the equator than Madras.

As we ascend higher and higher above the sea-level the temperature decreases at the rate of 1°C for every 165 metre. The earth has got the gravitational force and the atmosphere is attracted by it. The upper layer of the atmosphere also presses the lower layer. So the air is dense near the surface of the earth and as we go up the air gets thinner. The hot rays of the sun make the earth warmer. The earth radiates the heat of the sun during night time and makes the air near its surface hotter. The dense air near the surface of the earth is therefore hotter than the thin air at the higher altitudes. This is the reason why Madurai is warmer than Kodaikanal, which is situated on a high mountain (2100 metres above sea-level).

The land becomes hotter than the sea during the day time but becomes cooler very soon. On the other hand the sea absorbs heat slowly and gives up the heat slowly. Therefore in summer the sea wind is cool but in winter it is warm. So a place near the sea has a moderate climate (i.e.) not very hot in summer and not very cold in winter. The places near the coast have a low daily and annual range of temperature.

But the places far away from the sea are not influenced by sea breezes and so the daily and annual range of temperature is very high. Compare the range of temperature of Madras, on the sea-coast with that of Vellore, in the interior.

Air Pressure and Wind Belts

The upper layers of the atmosphere press the lower layers. At sea-level this atmospheric pressure is about 1 kg per 1 sq. cm. But we do not feel this pressure of air, because it presses us equally on all directions. We measure this pressure of air by using an instrument called the *Barometer*. At sea-level the air pressure supports a column of mercury with 76 cm. height in the barometer. But when we carry this instrument higher and higher from sea-level, this column of mercury falls at the rate of 2·5 cm. for every 270 m. of ascent.

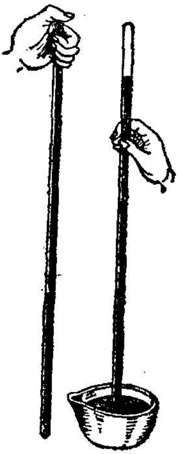

Fig. 4. Barometer

We have learnt that all the places on the earth's surface do not receive equal temperature by the sun's rays. The atmosphere also is not possessing equal temperature everywhere. Where the temperature is more, the air expands and so the pressure becomes low; but where the temperature is low the air contracts and its pressure increases.

There are permanent *high pressure belts* and *low pressure belts* on the surface of the earth. The air moves from these high pressure belts towards the low pressure belts. The air that moves horizontally on the

surface of the earth is called *wind.* Between 10° North and 10° South latitudes, the temperature is high throughout the year. The air expands, becomes light

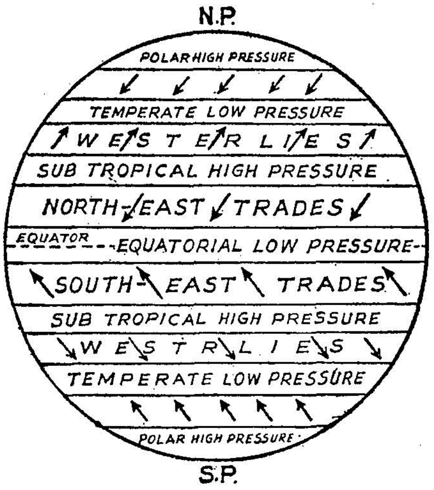

Fig. 5. Pressure and Wind Belts

and rises up. So the pressure of the air in the region decreases. The air that rises up from the equatorial regions is cooler and dense. This air due to the rotation of the earth is thrown towards North and South and descends between 30° and 40° North and South latitudes. So high pressure belts are formed in these places. At the poles, it is very cold. So high pressure belts are formed around North and South poles. Between these two high pressure belts low pressure belts are formed between 60° and 65° North and South latitudes.

The winds blow because there are differences in pressure in the atmosphere. The wind blows from the high pressure belt towards the low pressure belt. The

winds which blow from the high pressure belts to the low pressure belts do not blow straight north or south. Due to the rotation of the earth, the winds blowing in the northern hemisphere are deflected to the right and in the southern hemisphere to the left. This can be clearly understood by looking at the diagram Pressure and Wind Belts. *A wind* is always named after the direction from which it blows. For example, if a wind blows from the south-west, it is called the south-west wind. Now we shall study about the permanent wind belts of the world

(1) Trade Winds

Trade Winds are of two kinds namely the North-east Trade Winds and South-east Trade Winds. The North-east Trade Winds blow from the high Pressure belt formed between 30° and 40°N latitudes and the South-east Trade Winds blow from the high pressure belt formed between 30° and 40°S latitudes. These winds blow towards the low-pressure belt at the equator. These Winds were so named as these winds helped the traders in the ancient times to sail their ships. These winds blow steadily throughout the year.

(2) The Anti-trade Winds or the Westerlies

From the high pressure belts found between 30° and 40° North and South latitudes blow these Winds towards the low pressure belts found between 60° and 65° North and South latitudes. In the northern hemisphere they blow from the South-west and in the southern hemisphere from the North-west direction, Therefore they are called the South-west Anti-trade Winds and North-west Anti-trade Winds in the north

and south respectively. The South-west Anti-trades are also called the *West winds* and the North-west Anti-trades, the *Brave West winds.* These winds often change their direction and their velocity also changes. According to the season, they blow either north or south. Hence, they are also called *variable winds.* As the land surface is less and no mountains to check their speed in the southern hemisphere, they blow with a greater velocity.

(3) The Polar Winds

Throughout the year, very cold winds steadily blow from the high pressure belts around the poles towards the low pressure belts of the 60° - 65° north and south latitudes. These winds are called *Polar Winds* or *Polar Easterlies.*

Land and Sea Breezes

The land and water are not equally heated by the rays of the sun. In the day time the land absorbs

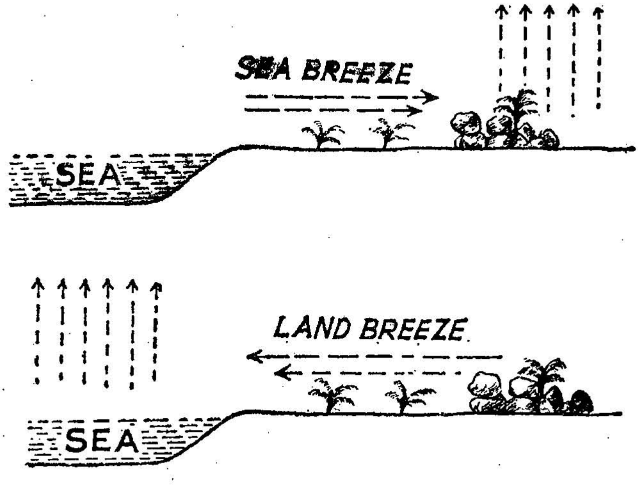

Fig. 6. Land and Sea Breezes

heat more quickly than sea. As the temperature is more on land, the pressure of air decreases. At the same time the temperature is less on sea and so the air pressure increases. We have learnt that wind moves from the high pressure area to the low pressure area. So during day-time the winds from the high pressure area on sea begins to blow towards the low pressure area on land. This wind is called *sea wind* or *sea breeze.*

During night time the land gives out heat quickly and becomes cold. The temperature of the air on it decreases, so the air becomes dense and pressure increases. But the sea loses the temperature slowly. So the temperature of the air on it is high and the pressure decreases. To equalise these pressure differences, the wind from the land blows towards the sea. This wind is called the *land wind* or *land breeze.*

QUESTIONS

I. Fill up the blanks

(1) The instrument used to measure the temperature is ———.

(2) The instrument known as ——— is used to measure the pressure of air.

(3) When air moves, it is called ———.

(4) The Anti-trade Winds are also called ———.

II. Answer the following questions

(1) What is atmosphere? What are its advantages?

(2) Name the gases found in the atmosphere and their uses.

(3) Why is it that the temperature decreases as we go away from the equator towards the poles?

(4) Into how many zones can we divide the earth on the basis of temperature of the air? Name them.

(5) What factors determine the climate of a place?

(6) Why do winds blow in different directions?

(7) What are Trade Winds? How do they blow?

(8) What are Anti-trades? Describe how they blow.

(9) What are Polar Winds?

(10) Explain with diagrams how the land and sea breezes are caused.

III. Practical Work

(1) What are the pressure belts found on the surface of the earth? Draw a diagram and mark them.

(2) Learn how to use a thermometer and a barometer to measure the temperature and pressure of air.

(3) From the newspaper Observatory Report, note down daily, for a month, the maximum and the minimum temperature of the day. From it, (a) find out and write down the average temperature of each day, (b) the daily range of temperature and (c) the average monthly temperature.

2. HUMIDITY AND RAINFALL

The important factors that determine the climate of a place are the moisture in the air and rainfall. The water in the seas, lakes and tanks is changed into water vapour by the heat of the sun. This change is known as *evaporation.* The water vapour goes up into the atmosphere as it is lighter than air. It is absorbed

by air and therefore is not seen. This invisible water vapour present in the air is called *humidity*. Hot air absorbs a greater quantity of water vapour than cold air. When this water vapour contracts into a solid or a liquid substance, that process is called *condensation*. If the humidity of the air attains the saturation point then it drops the excess moisture (the invisible water vapour) in the form of solid or liquid on earth. This is called *precipitation*.

The water on the surface of the earth evaporates and mixes with the air. This humid air due to heat becomes light and rises up. This rising air while coming into contact with the less dense air begins to expand and gets cooled The air becomes *saturated*. When the temperature of the saturated air decreases, the excess water vapour becomes water drops and becomes *clouds*. Clouds are the cooling of the water vapour into water droplets around dust particles. When a cold wind blows, the clouds further get cooled, become water drops and fall down. This we call it *rain*. In the upper layers of the atmosphere the water droplets in the humid air condenses into ice crystals. These ice crystals are called *hail stones*.

At nights, due to radiation, the land gives up its heat rapidly and becomes very cold. The temperature of the air also decreases. So the water vapour condenses into water drops and settles down on land, grass and leaves. This is called *dew*. Due to very low temperatures the water vapour in the air directly condenses into ice crystals. This we call it *frost*. The frost is harmful to the plants and causes hindrance to traffic on land. The water vapour in the air on a

cold land surface condenses around dust particles and floats on air. This we call it *mist*. When the density of the water drops in the mist increases, we call it *fog*. When the air cools below freezing point (0°C), the water vapour in the air freezes into *snow* and falls down. This we call it *snowfall*.

Rainfall

Rainfall is classified into three types. They are: (1) Relief Rainfall, (2) Convectional Rainfall, and (3) Cyclonic Rainfall.

(1) Relief Rainfall: If a mountain range is found along the sea-coast, the moisture bearing wind which blows from the sea is obstructed and forced to

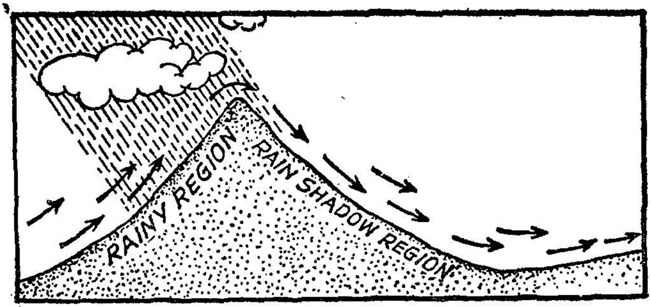

Fig. 7. Relief Rainfall

ascend the mountain side. When the wind moves up into the cooler atmosphere, it gets cooled and rainfall occurs on the *wind-ward* side. But rainfall decreases on the *leeward* side. The wind-ward side therefore, is called *the rainy region* facing rain-bearing wind, while the leeward side is called *the rain-shadow region*. Here the rainfall is the result of high mountains or the relief of the land and so is called the *Relief rainfall*.

For example, in summer, the south-west monsoon wind blowing from the Arabian Sea is obstructed and forced to rise into the higher atmosphere by the Western Ghats. So, the rising air gives heavy rains along the west coast region of India, while the leeward side of Western ghats and the Deccan plateau, the rain-shadow region, receives less rainfall.

(2) **Convectional Rainfall :** In day time, due to the heat of the sun, the air expands, becomes light and rises up. The rising air cools and its capacity to hold the water vapour decreases. So the excess water vapour condenses into water droplets and due to the gravitational force of the earth falls down on earth as rain. Such rainfall is called the *Convectional rainfall*.

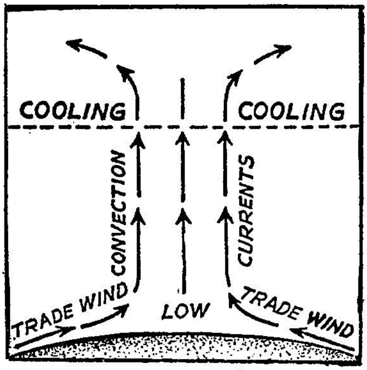

Fig. 8. Convectional Rainfall

Usually it is accompanied by thunder and lightning. This kind of rainfall is common in the Congo and the Amazon regions and in the East-Indies.

(3) **Cyclonic Rainfall :** In certain places on the earth's surface, sometimes the air is hotter than the air found in the surrounding places. Then the air

expands and rises up causing low pressure there. As the pressure around this region is high, the air blows towards the low pressure region in the centre. This causes a great whirl in the atmosphere. This whirl-

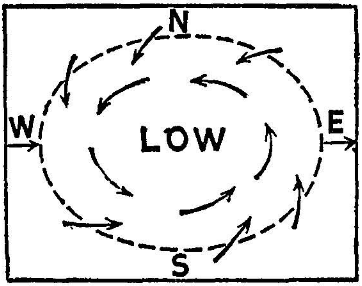

Fig. 9. A Cyclone

wind is called *cyclone*. Cyclones are also called *depressions*. Depressions occur in the Bay of Bengal in the Winter season. The east coast of India, especially Tamilnadu and Andhra Pradesh and Bangladesh receive heavy rainfall from cyclones. When they blow at a high speed, they cause much havoc and destruction to life and property.

QUESTIONS

I. Answer the following questions

(1) What is humidity?

(2) How do clouds form in the sky?

(3) How do hailstone, dew, frost, mist and fog form?

(4) How is rain caused?

(5) What is Relief Rainfall?

(6) How is Convectional Rainfall caused? Mention two places which receive such rainfall.

(7) What is a rain-shadow region? Explain with example.

(8) How is cyclone formed? Which parts of India receive rainfall from cyclone?

II. Practical Work

(1) Observe what kind of rainfall occurs in your place.

(2) *Mark on the map of India, regions which receive relief rainfall and cyclonic rainfall.*

3. LAND FORMS

The land forms that appear on the surface of the earth may be divided into three major types: (1) Plains, (2) Plateaus and (3) Mountains. Such land forms are not permanent features and they are not of the same type everywhere. They are being constantly changed by running water (rivers and streams), blowing winds and glaciers. By their action mountains are reduced to plateaus and plateaus into plains in course of time. When volcanoes erupt, lava flows and becomes hard rocks by cooling and spreading. These elevated places are called *plateaus.* The plateaus after thousands of years of weathering are changed into plains. Thus mountains change into plateaus and plateaus into plains.

Mountains and Valleys

Land forms that rise sharply to great heights above sea-level are called *mountains.* In certain places on the surface of the earth when stratified rocks are compressed by horizontal forces folds are formed.

These folds later rise up and form *fold mountains.* The Himalayas are formed in this way.

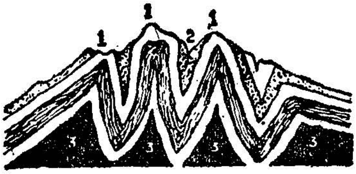

Fig. 10. Fold Mountain
1. Fold Mountains, 2. Fold Valley and 3. Old Rocks

In certain places owing to earthquakes parallel faults occur on the surface of the earth. When the land between two such faults is raised by vertical forces, the *block moumains* are formed. The Vindhya mountains are a good example for it. If the land between two such faults sinks below the surface, a *rift valley* is formed. The longest rift valley on the earth

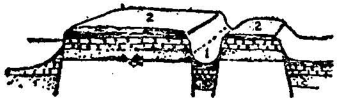

Fig. 11. Block Mountains and Rift Valleys
1. Rift Valley, 2. Block Mountains

is found extending from Lake Nyasa northwards across Africa and the Red Sea as far as the Dead Sea. Similarly the valleys of the Narmada and the Tapti in India are good examples of rift valleys. Mountain valleys are low lands lying between parallel mountain ranges. If rivers flow along such valleys, they are called *river valleys.*

In hilly regions rivers run very fast carrying away much silt and make the valleys deep. Such valleys are called V-*shaped valleys*.

Plateau

A *plateau* is a high land above sea-level almost flat and wide. The raised hilly parts are subjected to

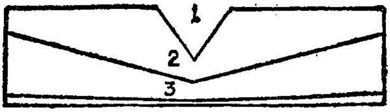

Fig. 12.

1. V. Shaped Valley, 2. Broad Valley, 3. Valley reduced to a peneplain

erosion by glaciers, rivers and other weathering processes of nature for many years. The hills are

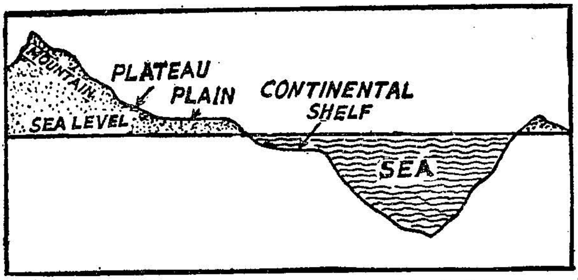

Fig. 13. Section through some typical Relief Features

slowly levelled down and thus become plateaus. The plateaus of Deccan and Tibet are good examples.

Coastal Plains

The narrow piece of land which lies along the sea coast is known as the *coastal plain.* In some places it is formed by the sediment of soil deposited by the rivers near the coast. In some other places it is the result of the raising of the sea-bed by forces exerted by earthquakes. The coastal plain in Florida in the United States of America, has been formed in this way by the raising of the sea-bed. The narrow plains lying between the Western Ghats and the Arabian Sea and the Eastern Ghats and the Bay of Bengal in India

are examples of coastal plains. Generally such plains are very fertile and populous.

The Continental Shelf

The Sea-bed, about 200 meters deep near the coast of continents is called the *continental shelf*. This submerged land is a continuation of the coastal plain. Such continental shelves are seen all around the coast of England and the eastern and western coasts of N. America.

Rivers bring and deposit on the continental shelf different kinds of sediments. Fish live on these continental shelves, feeding on them. They have become good fishing grounds. For example, the Dogger Banks in the North Sea and the Grand Banks near New foundland.

QUESTIONS

I. Answer the following questions

(1) How are fold mountains formed ? Give examples.

(2) How are rift valleys formed ? Give examples.

(3) What is a plateau ? How is it formed ?

(4) What is meant by continental shelf ?

(5) Name any two fishing grounds on continental shelves.

II. Practical Work

(1) Prepare a model either on paper pulp or clay showing different land forms.

(2) Visit and see any mountain that is near the place where you live.

(B) INDIAN UNION

1. INDIA: POSITION, SIZE, AREA AND PEOPLE

Position

India is our Motherland. It is also called Bharat. We who live in this land are proud to be called *Indians*. This country of ours has become famous in several aspects. Note the position of India in a map of the world. It occupies a very important position in the Northern Hemisphere, and is situated in the south of the continent of Asia. The Himalayas lie on the north of India; in the south is the wide Indian Ocean, in the west is the Arabian Sea and in the east is the Bay of Bengal. Thus, it is a peninsula because it is surrounded on three sides by the sea and on one side by land.

India lies between 8°N and 37°N Latitudes and extending from 68°E to 97°E longitudes. The Tropic of cancer (i.e. $23\frac{1}{2}$° N. Latitude) runs east to west dividing India into two parts namely North India and South India. Therefore, North India is in the temperate zone while South India is in the torrid or tropical zone. The $82\frac{1}{2}$°E longitude divides India into two parts namely east and west. The city of Allahabad lies on this longitude. On the north-west of our country lies Pakistan; on the north side countries like China, Tibet, Nepal and Bhutan are there and in the east Bangladesh and Burma are located; in the south lies Sri Lanka.

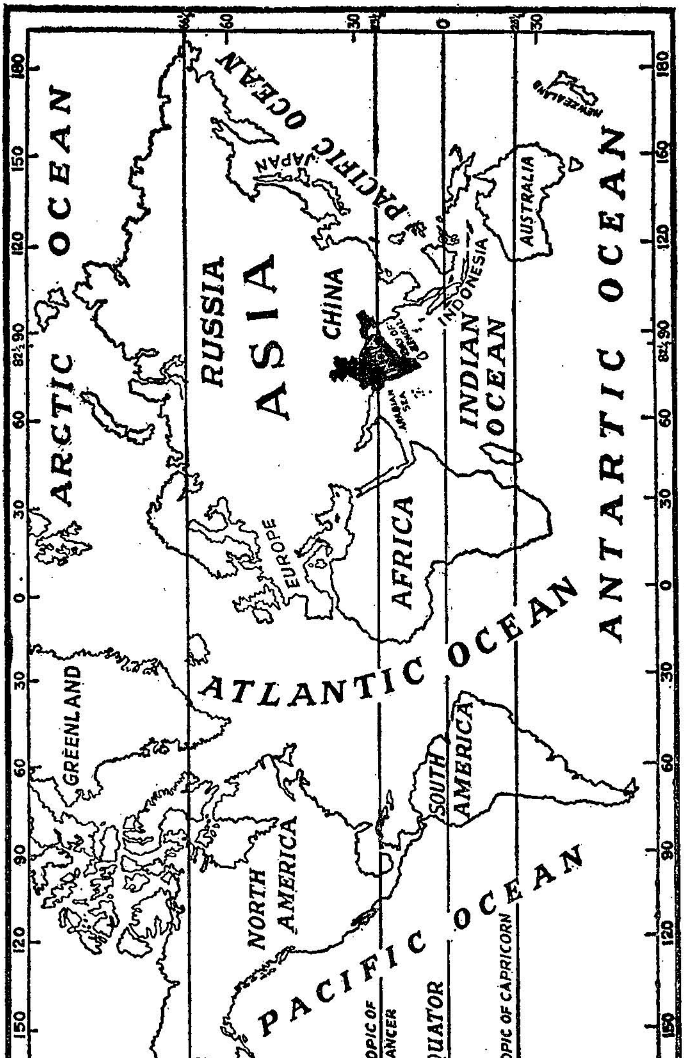

Fig. 14. WORLD. Position of India in the World

As India is situated in the prominent position in the Indian ocean, it is easy to carry on trade with all the countries bordering the ocean. It serves as a bridge connecting the Western countries with those of the Eastern and the Far-eastern countries. All the air-routes that connect them pass through our country. This central position has greatly helped our country to develop its economic progress in recent times.

Size and Area

The area of India is about 3·27 million square kilometre. It occupies the seventh place in area in the world next to Soviet Russia, China, Canada, Brazil, the United States of America and Australia. In extent it is equal to the continent of Europe excluding European Russia. It extends about 3214 km. north to south and about 2933 km. east to west. It has about 15,200 km. length of land boundary and about 6,100 km. length of sea-coast.

People

India has a population of about 547 million (as per 1971 Census). It occupies the second place in the world next to China in this respect. 178 persons live per square kilometre. The people speak several languages, and they belong to many religions. They are Hindus, Christians, Muslims, Sikhs and Jains. This great country has different kinds of physical features and climates. In spite of all the above differences we, Indians live together as one people.

QUESTIONS

I. Answer the following questions

(1) Why is India called a peninsula ?

(2) Give the latitudinal and longitudinal extent of India.

(3) What is India's Central latitude? Which longitude divides India into two?

(4) Name the climatic zones in which North India and South India lie.

(5) Mention the countries that lie along the borders of India.

(6) How is the position of India very important?

(7) State the area of India and the place it occupies among the countries of the world in area.

(8) Mention the length of its land-border and sea-coast.

(9) Mention the population of India and its density.

II. Practical Work

On an outline map of the world, mark the land of India, the important latitudes and longitudes, as well as the important countries and seas around it.

2 (A) PHYSICAL FEATURES AND RIVERS

The land of India may be divided into three physical divisions. They are: (1) The Himalayas in the north, (2) The North Indian plain, (3) The Deccan plateau and the coastal plains.

1. The Himalayan Ranges in the North

The Himalayan range starts from the Pamir knot in Central Asia and runs South-east in a long curve from Kashmir to Assam. The length is about 2,400 km. Its breadth at its base is about 240 km. to

320 km. These mountains are covered with snow above a height of 4,800 m and so are called the *Himalayas*, the home of snow. These ranges are a natural fortification in the north. They are fold-mountains. There are three ranges.

(a) The Inner Range

It is found far in the north with an average height of 5,000 m. Here are the highest peaks of the world *Everest (8848 m.), Kanchenjunga, Nanga Parbat, Nanda Devi, Dhaulagiri, Godwin Austin* etc. The highest peak of the world, Mt. Everest is located in Nepal.

(b) The Middle Range

It runs south of the inner range. Its average height is from 3,500 m. to 5,000 m. Many summer resorts like Darjeeling, Simla, Nainital are situated here.

(c) The Outer Range

It lies south of the middle range with an average height of about 1,000 m. At the foot of these hills are found the swamp forests called *Terrai*, where wild animals live. It is a very unhealthy place. The Siwalik hills are situated here. The most important passes found in the Himalayas are *the Jalapla* and *the Nathula*, connecting Darjeeling with Tibet; the *Shipki* pass connecting Simla with Tibet; and the *Zojila* pass connecting Srinagar with Sikiang.

There are also long ranges of hills on the north-eastern side of India as on the northern side. *The Patkai*, the *Naga, the Gharo, the Kasi and the Jaintia*

hills are just a continuation of the Great Himalayas in the north-east.

The Himalayas are of great advantage to India. They are so high and impassable that no enemy can easily cross them and attack India. They act as a natural barrier. They block the South West Monsoon winds and give rainfall to the Ganges and the Brahmaputra plains of North India. As these mountains are covered with snow, it melts in summer and provides the source of water to the rivers. They are always full of water. They also stop the cold winds blowing from central Asia and make the climate mild in winter in North India. The Himalayan streams bring down much silt and spread fertile alluvial soil over the plains. There are also several summer resorts in the Himalayas such as *Simla, Darjeeling, Nainital* and *Mussorie.* In the foot hills are forests where valuable timber trees such as teak and sal grow.

2. The Plain of North India

It lies between the Himalayas in the North and the Deccan plateau in the south. It extends from the Punjab in the west to the delta of the Ganges in the east for about 2400 kms. in length and for about 240 kms. to 320 kms in width. The Ganges and the Brahmaputra rivers and their tributaries flow in the plain. They bring fertile alluvial soil and make the plain fertile. This is the most fertile and the most thickly populated part of India. Many big cities of India are found here. It is about 200 mts. above sea level. The Malwa plateau and the Chota-Nagpur plateau are found south of this plain.

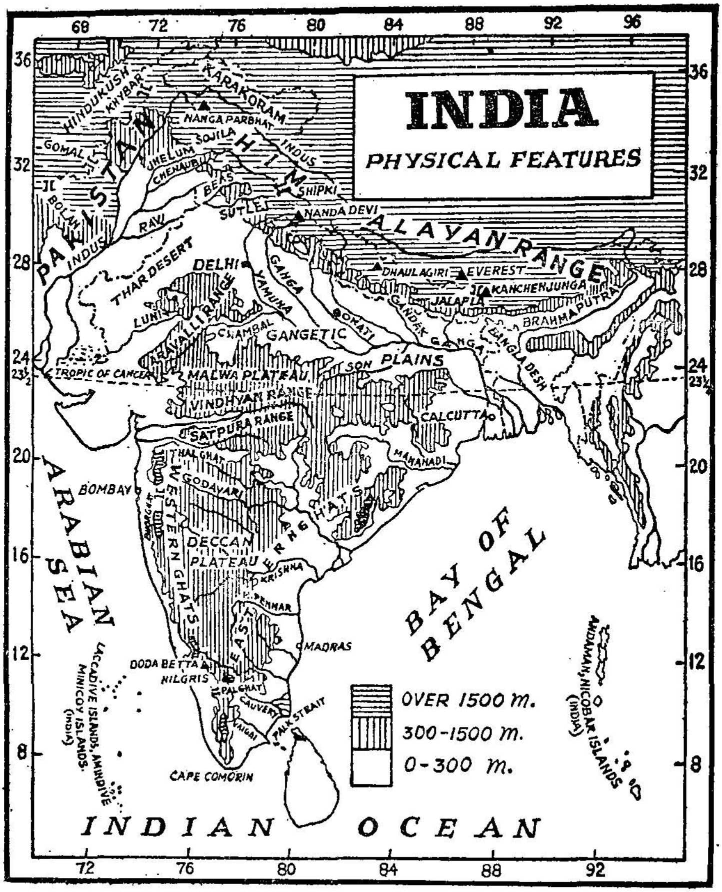

Fig. 15. INDIA. Physical Features

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

3. The Deccan plateau and the Coastal Plains

The Deccan plateau is a triangular plateau in the South India. This plateau is bounded in the North by the Vindhya and the Satpura mountains in the East by the Eastern Ghats and in the West by the Western Ghats. It is consisted of old hard crystaline rocks. Its height varies from 300 mts. to 700 mts. The north-western part of this plateau has been made up of black cotton soil formed by the weathering of volcanic rocks. This plateau is high in the west and slopes towards the east. Therefore we see the rivers of the Deccan, the Mahanadhi, the Godavari, the Krishna, the North and South Pennar, the Palar, the Cauvery, the Vaigai and the Tamprabarani, flowing east wards falling into the Bay of Bengal. The Aravalli Range is in the north-west of the plateau enclosing the Malwa plateau. The Thar desert lies west of the Aravalli Range. On the north-east of the Deccan lies the Chota Nagpur plateau.

The Eastern Ghats and the Western Ghats meet at the Nilgiris. The Western Ghats are one continuous range but the Eastern Ghats are broken by the river valleys. The Western Ghats are higher than the Eastern Ghats. *Anaimudi* (2703 m) is the highes peak in the Western Ghats. The next highest peak *Dodapettah* (2642 m) is found in the Nilgiris. South of the Nilgris extend *Anaimalais, Cardamom hills Palani hills* and *Aghastiya hills.* The Palghat gap, the Thal ghat and the Bhor ghat passes are found in the Western Ghats. The average height of the Eastern Ghats is 620 m. The Nallamalai, Javadu hills, Pachamalai and the Shevaroy hills are some of the important hills of the Eastern Ghats.

Between the Western Ghats and the west coast lies a narrow coastal plain. The northern part of the coast is called the Konkan Coast and the southern part of the coast is called the Malabar or Kerala Coast. The eastern coastal plain lies between the Eastern Ghats and the Bay of Bengal. The northern part of the coast is known as the Northern Circars while the southern part is called the Coromandal Coast. This coastal plain is wider than the western coastal plain. There are many fertile river deltas here.

Rivers

We may divide the rivers of India into :

(1) *The North Indian Rivers and* (2) *The South Indian Rivers.* The *Indus,* the *Ganges* and the *Brahmaputra* are the main rivers flowing in the North Indian plain. The Narmada, the Tapti, the Mahanadi, the Godavari, the Krishna, the Cauvery, etc. are the important South Indian rivers. The North Indian rivers differ from the South Indian rivers in many aspects. They are given below :

	The North Indian Rivers	The South Indian Rivers
(1)	They never dry up even in summer, because of the melting of the snow in the Himalayas.	These rivers dry up in the summer season.
(2)	They are long and deep and so are useful for navigation.	They are not long and deep. As there are waterfalls in many rivers, they are not useful for navigation.
(3)	As they have no waterfalls hydro - electric schemes are not practicable.	There are many waterfalls. So hydro - electric power is easily generated.
(4)	They provide the whole plain with alluvial soil.	They provide only their deltas with alluvial soil.
(5)	They are very useful for irrigation.	They irrigate small areas.

North Indian Rivers

The Indus

It is 2897 km. long. It rises in the Himalayas near the Manosarovar lake and runs through Jammu and Kashmir and Pakistan and falls into the Arabian Sea. Jhelum, Chenab, Ravi, Beas and Sutlej are its tributaries. The land through which these tributaries flow, is known as the *Punjab*. The *Bakra Nangal Dam* is built across the river Sutlej.

The Ganges

It is 2510 km. long. It rises from a glacier called the Gangotri, in the Himalayas and runs through the mountains and at Haridwar it reaches the plain. Then it flows through Uttar Pradesh, Bihar and West Bengal. It branches off as Bagirathi, the Padma and the Hoogli, and enters the Bay of Bengal. The chief tributaries, the *Yumuna*, the *Gomati*, the *Goghra*, the *Kandaki* and the *Kosi* join Ganges from the north, the *Son* joins Ganges from the south. On the banks of the rivers Yumuna located *Delhi*, *Agra* and *Mathura*. The tributary *Chambal* which rises in the Vindhya mountains joins the Yumuna. On the banks of the Ganges are situated the great cities like *Kanpur*, *Allahabad*, *Varanasi* and *Patna*. Calcutta is located on both the banks of the Hoogli, a distributary of the Ganges. The river Damodhar is a tributary of the Hoogli There are coal fields in the Damodhar valley which supply 90% of India's coal.

The Brahmaputra

Its length is 2900 km. It is the longest river in India. It rises in the Himalayas, near the Manosa-

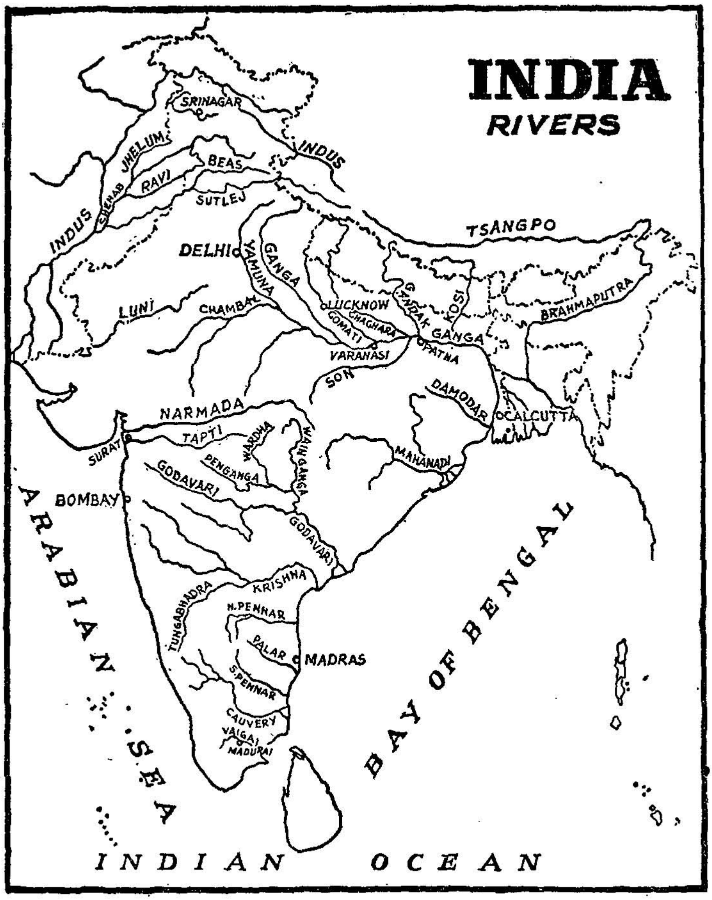

Fig. 16. India—Rivers

The external boundary of this map is certified as correct by the Director, Map Publications, Survey of India, Dehra Dun, in his letter No. TB 532/62-A-4/339, dt. 5—2—1977.

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

rovar lake and runs east through Tibet in the name of the *Tsangpo*. Then it enters Assam and joins the branch of the Ganges called the Padma and reaches the Bay of Bengal. The chief cities on its banks are *Golpara*, *Gauhati* and *Dibrugarh*.

The South Indian Rivers

The Narmada

It is 1280 km. long. It rises in the Maikal Range and runs west between the Vindhya and the Satpura mountains and joins the Arabian Sea. On its banks stands the city of *Broach*.

The Tapti

It is 640 km. long. It rises in the *Mahadev Hills* and flows west along the southern side of Satpura mountains and falls into the Arabian Sea. The ancient city of *Surat* stands on its bank.

The Mahanadhi

It is 890 km. long. It rises in the *Basthar Hills* of the Madhya Pradesh and runs through Orissa State and falls into the Bay of Bengal. The plain through which it runs is known as the *Chattisgarh Plain.* The *Hirakud Dam* is built across this river. It makes a delta, and at the head of the delta stands the city of *Cuttack*.

The Godavari

It is 1450 km. long. It is the longest river in South India. It rises in the Western Ghats near *Nasik* and runs through Maharastra and Andhra Pradesh till it reaches the Bay of Bengal. The Wardha, the Pen Ganga, the Wain Ganga, the Manjira and the

Indravathi are its main tributaries. The port of *Kakinada* is at its mouth.

The Krishna

It is 1240 km. long. It rises in the Western Ghats near Mahabaleshwar and runs through the States of Maharastra, Karnataka and Andhra Pradesh and falls into the Bay of Bengal. Its chief tributaries are the *Bhima* and *Tungabadhra.* The port of *Masulipatnam* is at its mouth.

The Cauvery

It is 760 km. long. It rises in the Coorg Province of the Karnataka State in the Western Ghats near Mercara. Its origin is known as *Talaikaveri.* It runs through the States of Karnataka and Tamilnadu and reaches the Bay of Bengal. Its chief tributaries are the *Bhavani,* the *Noyyal* and the *Amaravati.* The districts of Thiruchirappalli and Thanjavur are much benefitted by it. They are benefitted by the *Mettur Dam* and *Kallangi* constructed across the river Cauveri. There are waterfalls in its course at *Sivasamudram* in Karnataka and at *Hogenakkal* in Dharmapuri district of Tamilnadu. *Thiruchirappalli* is a big city on its banks.

North Pennar

It rises in the plateau of Mysore and flows through Andhra Pradesh and falls into the Bay of Bengal. All the other rivers of Tamilnadu are south of it.

The Palar and the South Pennar (Ponnaiyar)

Both these rivers rise in the Mysore Plateau and running through Tamilnadu fall into the Bay of Bengal.

The Vaigai

It rises in the Cardamom Hills and runs through Tamilnadu and enters into the Palk Strait. The city of *Madurai* stands on its banks.

The Tambraparani

It rises in the Agastiya Hills of the Western Ghats and runs through Tamilnadu. Its tributaries are *Chitraru* and *Manimuthar.* It falls into the *Gulf of Manaar.*

There are many short rivers which rise in the Western Ghats and run through the Western coastal plain and enters into the Arabian Sea. Chief among them are the *Periyar*, the *Nethravati*, the *Ponnani* and the *Aliyar.*

The Indian Sea Coast

The Indian sea coast though pretty long has only less number of good natural harbours because it is not broken and has not many gulfs and bays. *Bombay, Kandla, Marmagoa, Cochin* are some natural harbours in the West Coast; *Tuticorin, Madras, Vishakapatnam* are big ports along the East Coast. *Calcutta* is an important port on the river Hoogli. The Palk Strait separates Sri Lanka from India.

QUESTIONS

I. **Fill in the blanks**

(1) ——— is the highest peak in the Himalayas.

(2) The Eastern and the Western ghats meet at ———

(3) The dam across the river Sutlej is ———.

(4) The river Brahmaputra is called ——— in Tibet.

(5) ——— separates Sri Lanka from India.

II. Fill in the following table

Name of the river	Source	Tributaries	Distributaries	Important cities on its bank
1. The Ganges				
2. The Indus				
3. The Brahmaputra				
4. The Narmada				
5. The Godavari				
6. The Krishna				
7. The Cauvery				

III. Answer the following questions

(1) What are the three main Physical Divisions of India?

(2) Mention the highest peaks of the Himalayas. Which is the highest of them all?

(3) Name the four chief passes in the Himalayas and explain their importance.

(4) Mention the names of the mountains found in the north-east extension of the Himalayas.

(5) What are the benefits of the Himalayas to India?

(6) Mention the causes for the fertility of the 'Plain of North India.' Explain briefly the salient features of it.

(7) Write a short note on Terai forest.

(8) State the position of the Deccan and the hill ranges surrounding it.

(9) Name the rivers flowing in the Deccan. Why do they flow in the eastern direction?

(10) Compare the Western Ghats with the Eastern Ghats.

(11) Which is the highest peak in the Deccan and where is it found ?

(12) Mention the names of the hills in the southern part of the Western Ghats and those of the Eastern Ghats.

(13) Name the chief passes found in the Western Ghats.

(14) Compare the West Coastal plain with the East Coastal plain.

(15) What differences do you find between the North Indian rivers and the South Indian rivers?

(16) Name the tributaries of the Indus. Across which tributary is the Bakra Nangal dam built?

(17) Name the tributaries of the Ganges.

(18) Name the states through which the Ganges runs.

(19) Name the chief cities found on the banks of the Ganges and the Yumuna.

(20) Which is the longest river in India ? What cities are situated on its bank?

(21) Which river forms the plain of Chattisgarh ? What dam is built across it ? Name the state in which it is situated.

(22) Name the rivers of South India.

(23) Which is the longest of the South Indian rivers? Name its tributaries.

(24) Mention the states through which the Krishna runs and its tributaries.

(25) Name the tributaries of the Cauvery? Which districts of Tamilnadu are benefitted by it?

(26) Name the rivers of Tamilnadu.

(27) Mention the short rivers rising from the Western Ghats which run westwards and enter into the Arabian Sea.

(28) Name the chief sea ports of India?

(29) Which strait separates Sri Lanka from India?

IV. Practical Exercises

(1) Mark on an outline Map of India the following

(a) The Himalayas, Mt. Everest, Garo, Kasi and Jaintia Hills, the Aravallis, the Vindhyas and the Satpuras, the Western Ghats and the Eastern Ghats.

(2) The Ganges, the Yumuna, the Brahmaputra, the Narmada, the Tapti, the Mahanadi, the Godavari, the Krishna and the Cauvery.

(3) Thal ghat, Bhor ghat and Palghat gap.

(4) The Konkan Coast, the Malabar Coast, the Northern Circars, the Coramandal Coast, the Palk Strait, the Gulf of Manaar

(5) Make a large relief map of India using either clay or paper pulp. Mark on it the chief mountains, plateaus and rivers.

2 (B) CLIMATE

The atmospheric condition of a day at a place with regard to temperature, rainfall, wind and humidity is called *weather*. The weather condition is reported daily in the Newspapers and by the Radio. The average condition of the weather over a large area during a long period is called *climate*.

The climate of a region depends upon its distance from the Equator, height of that place from the sea-

level, its distance from the sea, its temperature, the direction of the wind and the rainfall. We studied about all these in the previous lesson. Now we shall study about the climate of our country.

Look at the maps of India showing the July and January temperatures. The lines drawn across them are isotherms. The imaginary lines passing through the places having the same temperature are called *isotherms.* Our country lies north of the Equator. The Tropic of Cancer ($23\frac{1}{2}°$ N. Latitude) runs right across the middle of our country. Therefore, it has tropical climate. It gets the monsoon winds and so enjoys the *tropical monsoon climate.*

The winds that blow in opposite directions in two different seasons in a year are called *Monsoon winds.* India receives rainfall due to South-west monsoon winds in summer and North-east monsoon winds in winter:

We shall study the climatic conditions of our country i.e. the distribution of temperature, the direction of the wind and rainfall during the *summer* and *winter* seasons.

Summer Season

From 21st March to 23rd September the sun is moving in the northern hemisphere and on 21st of June it shines vertically over the Tropic of Cancer. So the vertical rays of the sun falls over India. In this period India experiences summer conditions; particularly the month of May is the hottest month in India. From the map showing July isotherms it is clear that

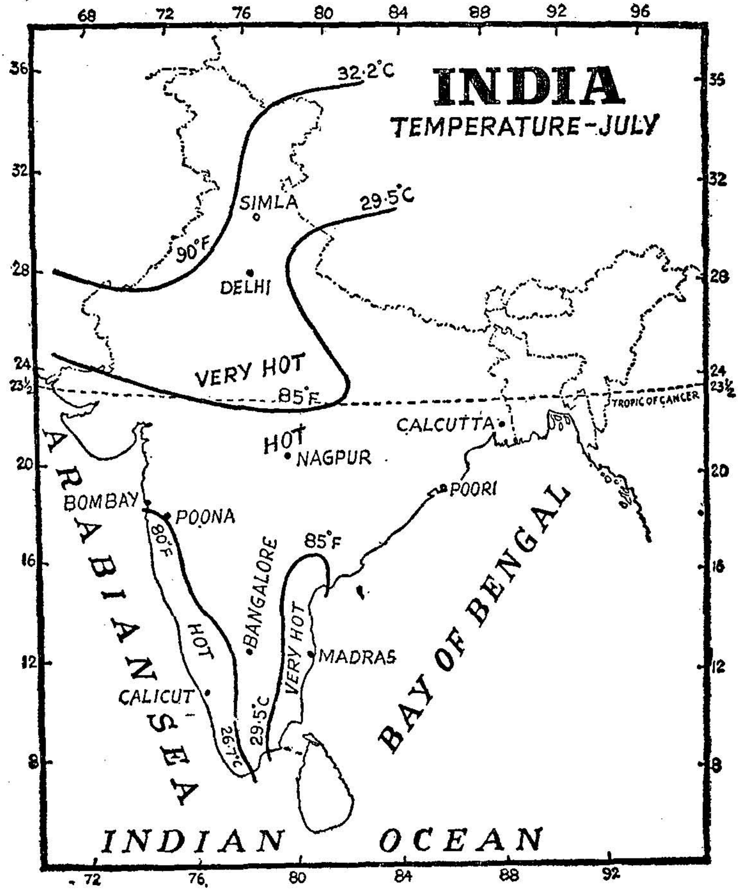

Fig. 17. July Isotherms

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

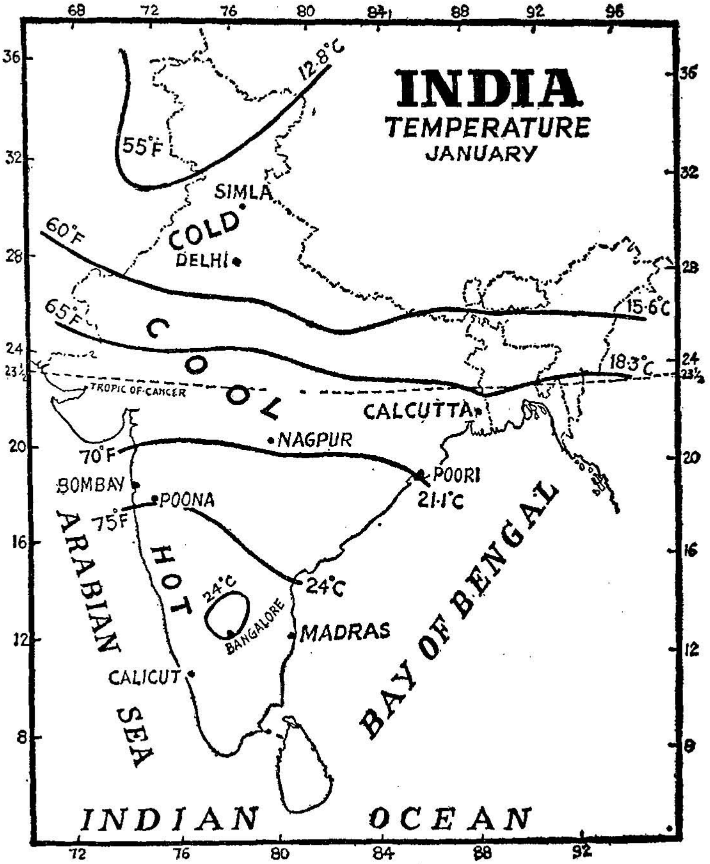

Fig. 18. January Isotherms

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

the temperature increases as we go towards north from the Equator. North-western part of India is the hottest region during the summer season in India.

During April and May the vertical rays of the sun fall over the region of the Tropic of Cancer. So this region becomes very hot; the warm air expands and rises up so that the pressure of air becomes less. During this time, at the south of the Equator, in the region of the Tropic of Capricorn the temperature is less and the pressure of air is high. The wind begins to blow from the high pressure area towards the low pressure area in the north in the name of *South-East Trade winds*. The South-East Trade winds when they cross the Equator, deflect and change their direction due to the rotation of the earth from west to east, and blow as *South-West monsoon winds*. When they pass over the Indian ocean they gather moisture. The moisture laden winds branch off into two and one branch blows over the Arabian Sea and the other branch blows over the Bay of Bengal.

The Arabian Sea branch of the monsoon winds is blocked by the Western Ghats ; it gives heavy rainfall to the narrow western coastal plain along the Malabar and the Konkan coasts. The Deccan Plateau which lies east of the Western Ghats is a *rain-shadow region*. So it receives less amount (50 to 100 cm.) of rainfall. For example, Bombay receives 200 cm. of rainfall while Pune in the rain-shadow region receives 50 cm. The winds give moderate rainfall (50 to 100 cm.) to the narrow valley between the Vindhya and Satpura ranges, western Gangetic plain and the southern slopes of the Himalayas.

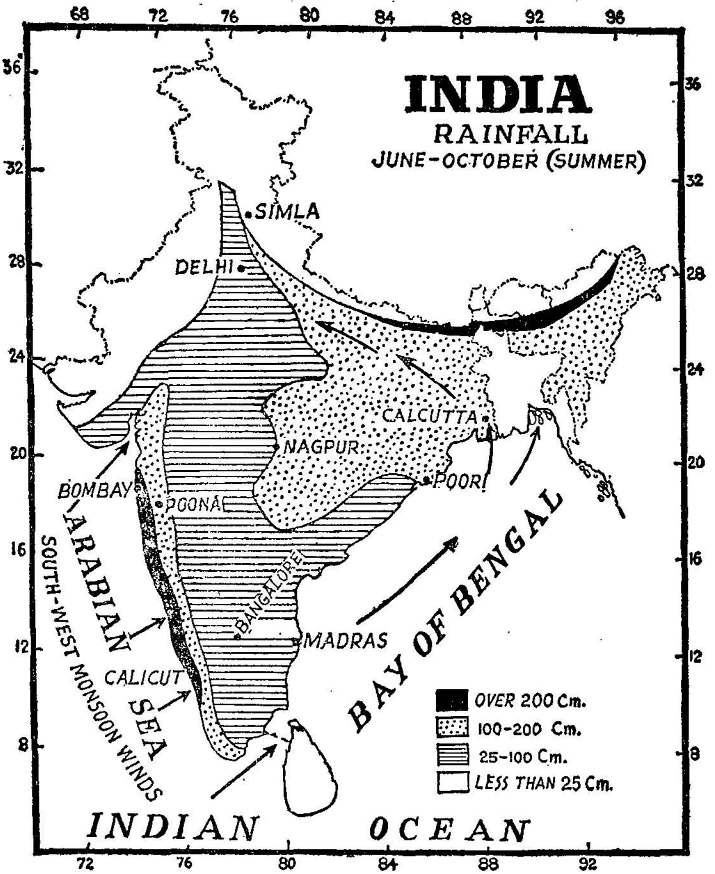

Fig. 19. Rainfall in Summer (June - October)

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

The Bay of Bengal branch of the South-West monsoon winds is blocked by the Gharo, Kasi and Jaintia Hills. Cherrapunji on the southern slopes of the Kasi hills receives 1200 cm. of rainfall. This is the place which receives the highest rainfall in the world. The winds that are blocked by the Himalayas turn westwards, towards the low pressure Punjab region and blow over the Gangetic plain. They slowly lose moisture; so the rainfall decreases gradaully when they blow from east to west over the Gangetic plain. For example, Calcutta receives 150 cm. of rainfall and Delhi receives 60 cm. of rainfall. The monsoon winds give about 100 cm. of rainfall to the Northern Circar region.

India receives about 80% of rainfall from the South-West monsoon winds in summer. They blow from June to September.

The Winter Season

From September 23rd to March 22nd, the sun travels or moves over the southern hemisphere and on 21st of December, it shines vertically over the Tropic of Capricorn (23½°S. Latitude). At this time, the rays of the sun fall *slantingly* over India. Therefore during this time, the temperature is less and we call this as *winter*. January is the coldest month in India. See the map of India showing the January temperature. The Isotherms show that the temperature decreases as we go from South to North. North India is much cooler than South India.

The *North-East Monsoon winds blow* during winter. From September onwards North India becomes very cold and the air-pressure is very high.

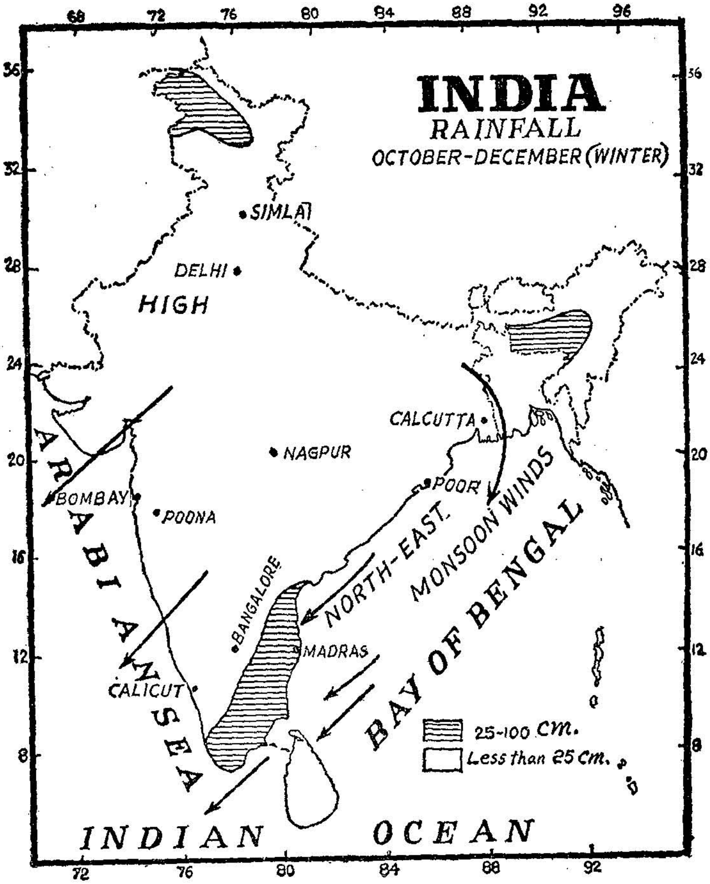

Fig. 20. Rainfall in Winter (October - December)

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

But the region south of the Equator has low pressure. So the wind starts blowing from the high pressure area in Central Asia across India to the South. As the winds blow from the North-east, they are called the *North-East monsoon winds.* As they are blowing from the land, they are dry. They blow during October, November and December. When the winds blow over the Bay of Bengal, they absorb moisture and blow over the coastal regions of Tamilnadu; they give moderate rainfall (100 cm.) to the Coromandal Coast. Therefore, this is the rainy season for Tamilnadu. The coastal regions of Tamilnadu receive a larger amount of rainfall than the interior regions. The distribution of rainfall varies from 25 cm. to 100 cm. The elevated regions of the Nilgiris, the Anamalais and the Palani Hills and the Kanyakumari district receive rainfall from both the monsoon winds. Northern Kashmir and North-west India do not receive rainfall from both the monsoon winds.

Cyclones

Cyclonic storms occur in April and May and in October and November when the direction of the monsoon winds changes in the Bay of Bengal. These cyclones give good rainfall to Tamilnadu, Andhra and Orissa coasts. Sometimes, these storms cause great damage to life and property.

The Rainfall Regions of India

We may divide India into four rainfall regions based on the amount of average annual rainfall each region gets:

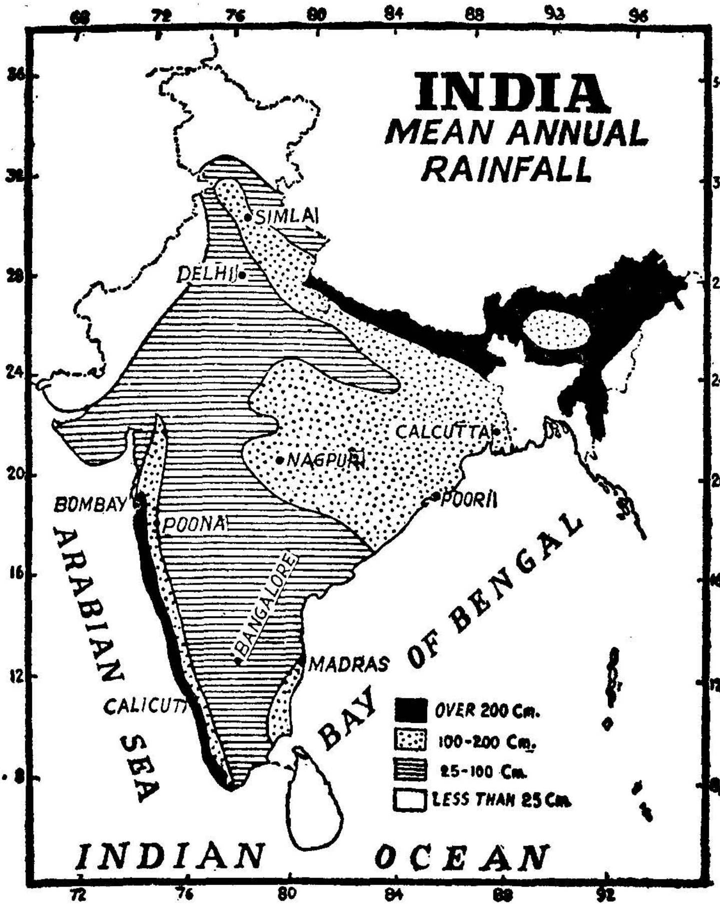

Fig. 21. Mean Annual Rainfall

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

(1) Regions of very heavy rainfall (More than 200 cm. of rain).

West Bengal, Assam and West Coastal plain.

(2) Regions of heavy rainfall (100 to 200 cm. of rain).

North-East Deccan and Central Gengetic plain.

(3) Regions of moderate rainfall (25 to 100 cm. of rain).

Tamilnadu, South Deccan, North-West Deccan Upper Gangetic plain.

(4) Regions of low rainfall (Less than 25 cm. of rain).

The Punjab, Rajasthan and North-West India

QUESTIONS

I. Fill in the blanks

(1) The sun shines vertically over ——— latitude on June, 21st.

(2) The South-West monsoon winds blow over India during the months of ———, ———, ———, ———.

(3) During the months of ———, ———, ——— the North-East monsoon winds blow over India.

(4) The heaviest rainfall in the world occurs in ————.

II. Match the following

	A		B
(1)	The tropic of Cancer	—	Area receiving winter rainfall
(2)	The coldest month	—	May
(3)	1,200 cm. annual rainfall	—	23½°S. Latitude
(4)	The tropic of Capricorn	—	The Deccan Plateau
(5)	The hottest month	—	Cherrapunji
(6)	The Coromandel coast	—	23½°N. Latitude
(7)	The rain-shadow region	—	January.

III. **Answer the following questions**

(1) What are isotherms?

(2) What are the factors that determine the climate of a place?

(3) What are seasons of India? Mention the winds that blow over India during these seasons.

(4) What do you learn about the climate of India from the January and July isotherm maps?

(5) How are the South-West Monsoon winds caused?

(6) Which regions of India receive rain by the South-West Monsoon winds?

(7) Which regions of India receive rain in the winter season? Give reasons.

(8) What is meant by a rain shadow region? Give an example.

(9) Give reasons for Delhi receiving less rainfall than Calcutta.

(10) Why do the South-West Monsoon winds give more rainfall than the North-east monsoon winds?

(11) Name the regions which get rainfall both in summer and winter?

(12) At what season does North-west India receive a little rain?

(13) When do cyclones occur in India? What are their results?

IV. **Practical Work**

Mark the following on an outline map of India:

(a) July isotherms, (b) January isotherms, (c) The direction of winds during the South - West monsoon season and the regions receiving rainfall, (d) The direction of the North - east monsoon winds and the places receiving rainfall.

3 (A) SOILS

The weathering processes disintegrate rocks into particles. With the passage of time, these particles become finer and form a thin surface layer, known as *soil.* Soil is one of the natural resources covering the surface of the earth. The nature of the soil determines the natural vegetation and agricultural crops. In a large country there are different kinds of soils.

The soils found in India are of five different kinds. They are *alluvial soil, black-cotton soil, red soil, laterite soil* and *sand.* We shall study the nature of each soil now.

Alluvial Soil

Alluvial soil is very fine mud brought down by the rivers. This is very soft and fertile. It contains very fertile and productive substance like limestone, phosphate and potash. This soil is found in the plains of the Ganges and in the river deltas of the Peninsular India and along the West coast plain. This soil is the most suitable for agriculture and so paddy, sugarcane, wheat, jute and bananas are grown in it.

Black - Cotton Soil

This soil is also called *Regur.* The lava emitted by the volcanoes spread on the surface and solidified as volcanic rocks. The weathering of volcanic rocks formed this soil. This soil is rich with potash and limestone. It is black in colour. It absorbs water and retains the moisture for a long time. Therefore, even

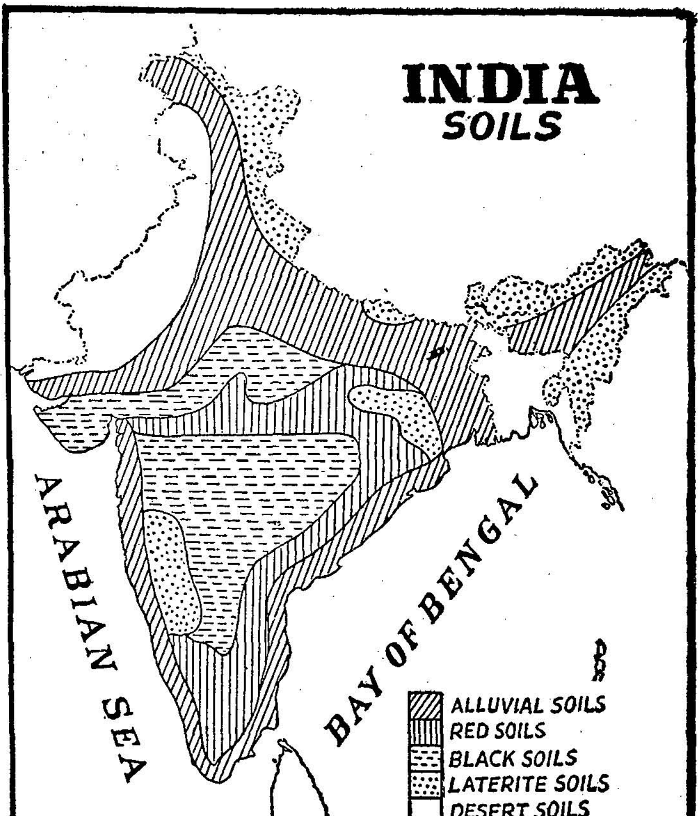

Fig. 22. India-Soils.

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

in the dry season it is useful for cultivation without irrigation facilities. This soil is best suited for the cultivation of cotton. Oil seeds and pulses can also be cultivated in this soil. This soil is found largely in Gujarat, Maharastra, Andhra Pradesh and Tamilnadu. The North-West part of the Deccan is full of this soil and so it is called the *black soil region.*

Red Soil

Red soil is formed by the weathering of old sedimentary rocks. It is called red soil because it is red in colour. This soil contains less limestone, nitrogen and iron. It is found fertile in the river plains but infertile on the slopes of the hills. In the infertile regions millets like cholam, cumbu and ragi and groundnuts are grown. Paddy, sugarcane and bananas are grown in fertile places. Orchards and flower gardens are found in the red soil. This soil is extensively found all over India and especially in Tamilnadu, Andhra Pradesh and Karnataka states.

Laterite Soil

This soil is formed by the weathering of sedimentary rocks. It resembles red soil but contains small pebbles. It contains less iron and limestone but highly acidic in its nature. It is not fertile. As it is mixed with sand it does not retain water for a long time. Generally it is not suitable for cultivation. Along the slopes of hills where this soil is found, tea is planted. This soil is found on the slopes of the Eastern and Western Ghats, Orissa, West Bengal, Assam and Andhra Pradesh.

Sand

Nitrogen content is very little in sand. It is found largely on the bank of rivers and on the sea-shore. Sand is formed by the weathering of rocks in the deserts The sand at the coast is brought down by the rivers and also formed by the erosion of the sea waves along the coast. Coconut trees, palm trees and cashew nut trees grow well in the sandy soil. In West Rajasthan and the Thar desert thorny trees and bushes are found

QUESTIONS

I. Fill in the proforma given below

Name of the soil (1)	Formation (2)	Charac-teristics (3)	Substances found in it (4)	Places where it is found (5)	Crops grown (6)

II. Practical Work

(1) Mark on an outline map of India the regions where different kinds of soils are found.

(2) Collect the samples of the five kinds of soils and put them in glass bottles and label them.

(3) Note the nature of the soil in your locality and the kinds of crops cultivated there.

3 (B) FOREST AND FOREST PRODUCTS

The trees and plants which grow without the effort of man are known as *natural vegetation.* The natural vegetation found in a region depends upon soil, temperature and rainfall. The natural vegetation of our country differs from place to place as different types of climate and soils are found. Natural vegetation consists of forests, grass lands and thorny bushes.

We find in India five different types of forests. They are: (1) *Evergreen forests,* (2) *Monsoon forests,* (3) *Tidal forests,* (4) *Thorny bushes* and (5) *Mountain forests.*

Ever-green Forests

The trees in these forests are always found green. They are found in places where the temperature is high and the rainfall is heavy. These, forests are found on the western slopes of the Western Ghats, on the eastern slopes of the Himalayas upto 1500 m. and in Assam. In these forests grow trees such as ebony, blackwood, deodar, sal, redwood, teak, bamboo and rubber.

Monsoon Forests

These forests grow in places where the annual rainfall is between 100 cm. and 200 cm. The trees shed their leaves in the hot, rainless months to protect themselves; so they are also called *deciduous forests.* These forests are found on the eastern slopes of the Western Ghats, north-eastern part of the Deccan and the lower slopes of the Himalayas. Valuable trees like

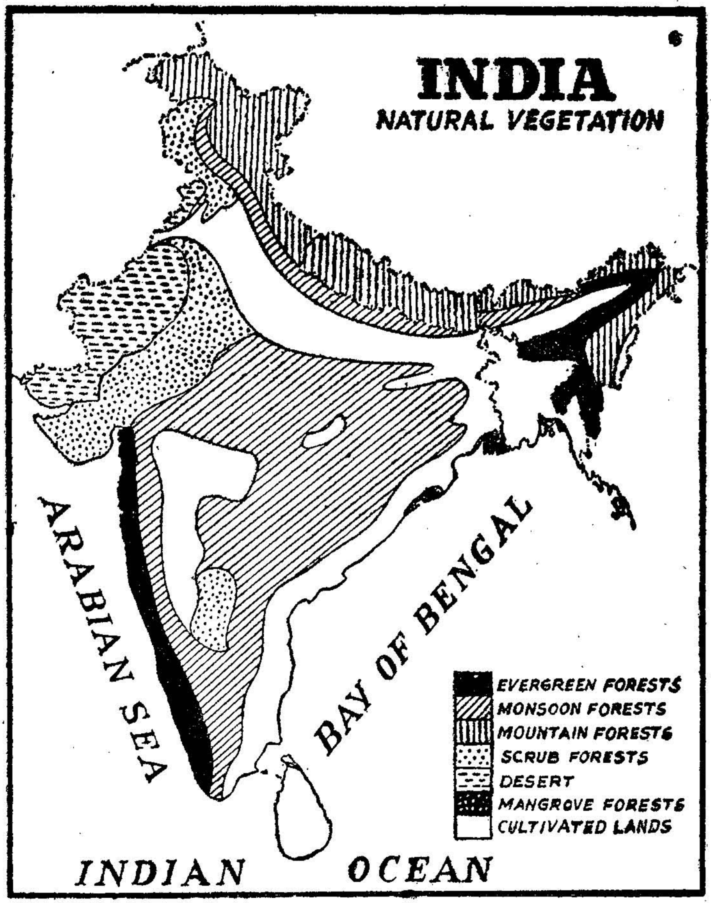

Fig. 23. Forests

The territoral waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

teak, sal and sandal wood grow in these forests and they are protected by the Government.

Tidal Forests

These forests are also called *Mangrove forests.* They are found on the swamps near the sea-coast, the deltas of the Ganges, the Brahmaputra and the Mahanadi. The tidal forests found in the deltas of the Ganges and the Brahmaputra are called the *sundarbans.* The Terai forest found at the foot of the Himalayas is also of this type. The trees grown here are used as fire wood

Thorny bushes (Scrubs)

These forests grow in places where the average annual rainfall is less than 75 cm. Short thorny trees and bushes are found here. The accacia trees that grow here can withstand the dry condition. These forests are found in the north-west India and the Central Deccan.

Mountain (Alpine) Forests

These forests are found on the higher slopes of the Western Ghats and the Himalayas. They vary according to the height and climate of the place. In the Himalayas we find the ever-green forests, monsoon forests and the coniferous forests, growing according to the elevation. In the coniferous forests we find trees such as pine, fir, spruce and birch. These are soft-wooded trees.

The uses of the forests and the products obtained from them

Forests are useful to us in many ways. They cause rainfall and prevent soil erosion and land slides.

They control the floods in the rivers and prevent storms and gales. They are the home of wild animals. They enhance the beauty of a country.

The trees like teak and sal are used in building houses, for making railway sleepers and making fishing boats. Sandal wood is used for making soap; Eucalyptus tree is used for making Eucalyptus oil; Pine, fir, spruce, cane and bamboo are used for making paper, matches and pencil. Rubber is used for making tubes and tyres for automobiles. Barks of a certain kind of trees like wattle found in the forests are used for tanning leather. Many kinds of herbs are found in these forests. Wax, honey, resin and gum are also collected in the forests.

As forests are very useful our Government is taking steps to preserve and extend the area of the forests.

QUESTIONS

I. Answer the following questions

(1) What is meant by Natural Vegetation? Name the natural vegetations found in India.

(2) Which are called the Mangrove forests?

(3) What are the uses of forests?

II. (a) Match the following

(1)	Ever-green forests	—	Sundarbans
(2)	Monsoon forests	—	Accacia
(3)	Tidal forests	—	Coniferous forests
(4)	Thorny bushes	—	Needs much heat and rain
(5)	Mountain forests	—	Deciduous forests.

II. (b) Fill in the proforma given below

Name of the forests	Climate required	Region where it is found	Kinds of trees grown

III. Practical Work

(1) Draw a map of India showing the different kinds of natural vegetation. Use different colours or symbols.

(2) Collect the products obtained in the Indian forests and preserve them in your school museum.

4. IRRIGATION AND IMPORTANT IRRIGATION PROJECTS

Most of the people of India are agriculturists. Our country is a monsoon land. The monsoon rain fails on many occasions and the rainfall is also not equal in all the places. It rains only in certain months of the year. Our country gets most of its rain in summer. The west coastal plain and Assam receive the highest rainfall during this season. But Tamilnadu receives a good amount of rain in the winter season. In places like Punjab and Rajasthan the rainfall is very much less.

In a rainless region irrigation becomes essential. Water is supplied to the fields by means of channels

from the wells, tanks, lakes and rivers. This method of supplying water to the fields is called *irrigation.*

There are three kinds of irrigation methods followed in India. They are: (1) *tank irrigation,* (2) *well irrigation,* (3) *canal irrigation.*

Tank Irrigation

Lakes are large natural pits or hollows found in the land in which rain water collects itself. Men also dig large pits to collect rain water. They are called tanks. These lakes and tanks store up excess water available during the rainy season. This water is taken to the fields by the farmers through channels in the dry months. They call this as *tank irrigation.* Tank irrigation is largely under practice in the States of Tamilnadu, Andhra Pradesh, Karnataka and Orissa.

Well Irrigation

Wells are dug to collect the underground water and bring it to the surface to irrigate the fields. This type of irrigation is followed in all places where there are no rivers or tanks or when these dry up in the hot summer season. Men lift the water from wells by using large vessels or bags made of leather and drawn by bulls walking forward and backward on a sloping ramp. Now-a-days in most of the areas, the farmers use electric motors to pump water from the wells. This method of irrigation is called *well irrigation* and is common in the states of Uttar Pradesh, Punjab, Rajasthan, Tamilnadu, Maharastra, Andhra Pradesh, Karnataka and Madhya Pradesh.

Canal Irrigation

Canal irrigation is so called because water is taken to the fields by canals from reservoir or river beds. Such canals are three types: (1) *perennial canals,* (2) *flood canals,* (3) *canals from reservoirs.*

(a) **Perennial Canals**

These canals are fed by perennial rivers with regulated flow. As these canals continuously supply water agriculture thrive wells.

(b) **Flood Canals**

These canals are on a higher level than the river-beds and so supply water to the fields only during floods when the water level rises. But these canals dry up when the water level is low.

(c) **Canals from Reservoirs**

Man builds huge dams across rivers and stores up water in large reservoirs. This water is supplied to the fields by canals. This method is called canal irrigation. The reservoir-canal system is found in the States of the Punjab, Uttar Pradesh, Andhra Pradesh and Tamilnadu.

Bore Well Irrigation

Deep bores are sunk in the ground until the water-table is reached. Pumps are inserted through the bores and water is pumped up by using electric motors and supplied to the fields. This method is practised largely in Uttar Pradesh, Bihar, Punjab and Haryana.

Important Irrigation Projects

Large dams are built across some rivers not only for irrigating the fields but also for other purposes

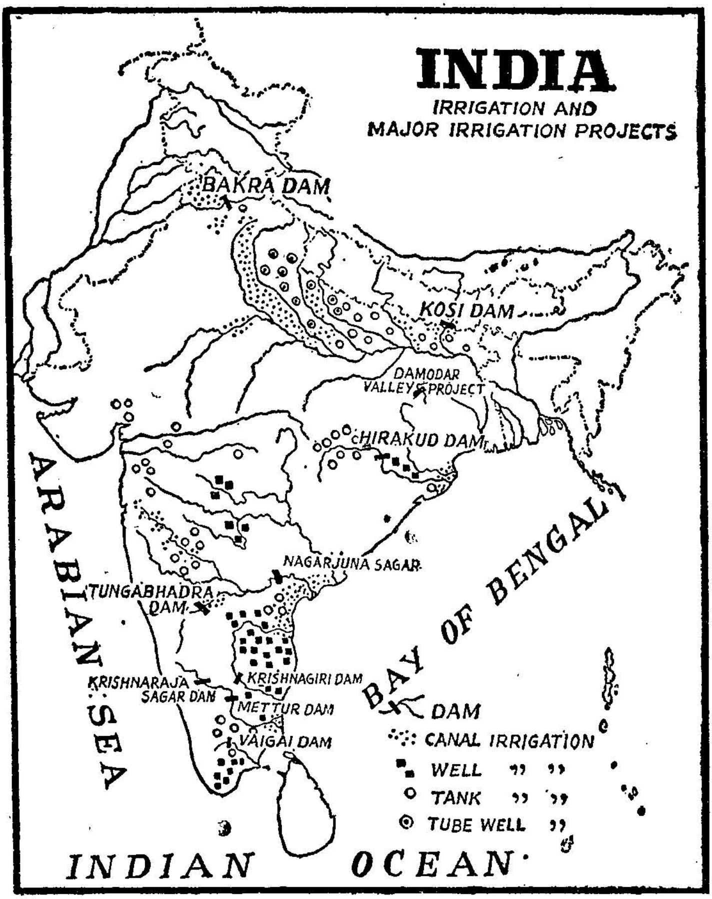

Fig. 24. Irrigation and Important Irrigation Projects

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

such as generating hydro-electric power, boat traffic on the canals, controlling the floods and developing fisheries, etc. These are called *multi purpose projects.* They have been planned for improving mainly agricultural and industrial sectors of the country.

The Bhakra-Nangal Project, the Damodar Valley Project, Kosi Project and Hirakud Dam in North India and Nagarjuna Sagar Project, Tungabhadra Dam and Mettur Dam in South India are some of the important multi purpose river valley projects in India.

(1) **The Bhakra-Nangal Dam :** This is built across the river *Sutlej* at Bhakra and Nangal in the Punjab. This is the *highest dam* in India and several

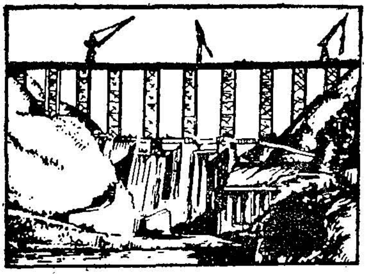

Fig. 25. Bakra Nangal dam over the Sutlej in the Punjab

canals start from it and make the fields in the Punjab, Haryana and Rajasthan fertile. The farmers of Punjab raise large bumper crops every year and so the Punjab is known as the *Granary of India.* Electricity is also generated here and is supplied for all the agricultural and industrial needs of the Punjab.

(2) **The Damodhar Valley Project:** Every year heavy floods occur in the Damodhar river in the rainy

season. To prevent loss of life and damage to the villages, the Government has built several dams to control the floods. These dams hold the water in reservoirs and help to irrigate the fields, generate electricity and to carry on boat traffic. This project is one of the largest multi purpose projects in India. It benefits the States of Bihar and West Bengal.

(3) **The Kosi Project:** The river *Kosi*, a tributary of the Ganges in Bihar, overflows its banks every year in summer and causes much damage to men and materials. So this dam is built to prevent this. This project is of great benefit to the state of Bihar and the country of Nepal.

(4) **The Hirakud Project:** A large dam, the *longest* in the world (4800 m.), is built across the river

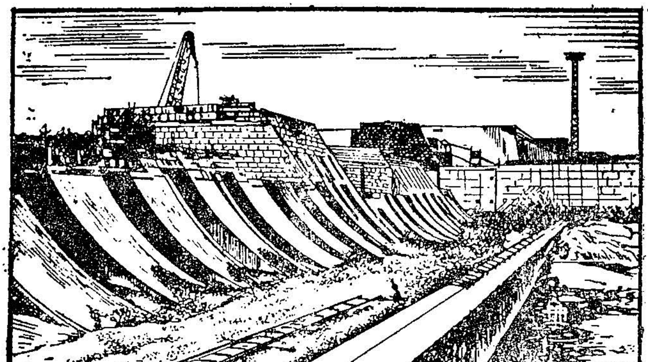

Fig. 26. Hirakud dam across the Mahanadi

Mahanadi in the State of Orissa. It irrigates lands, produces hydro-electric power, besides controlling the

floods in the rainy season. As a result of this project, Orissa which had been a backward state is now improving in many ways.

(5) The Nagarjuna Sagar Project: A dam is built across the *Krishna* river in Andhra Pradesh. The river valley does not receive enough rain for cultivation. So the dry district of Guntur, Nellore, Krishna and Kurnool are benefitted by this project. It is the *biggest* dam in South India.

(6) The Tungabadhra Project: This dam is built across the river *Tungabadhra*, a tributary of the Krishna. Electricity generated here drives the machinery in the factories of Andhra Pradesh and Karnataka. This dam also supplies water to fields in those states.

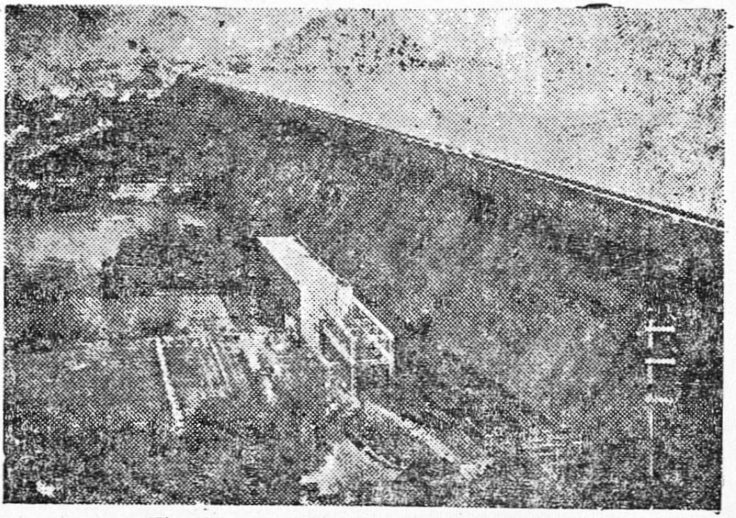

Fig. 27. Mettur dam across the Cauveri

(7) The Mettur Dam Project: This dam is built across the river *Cauveri* in Tamilnadu at Mettur. It

provides irrigation facilities and Electricity to Tamilnadu. The Mettur dam irrigates the lands in Salem, Periyar, Trichirappalli and Tanjore Districts.

QUESTIONS

I. Answer the following questions

(1) What is meant by irrigation ?

(2) Why is irrigation necessary for our country ?

(3) What methods of irrigation are practised in our country ? Mention the names of states where each is followed.

(4) What are the different types of canals ? Describe each.

(5) What is meant by a multi purpose project ? Give two examples.

II. Fill in the blanks

(1) Lake irrigation is chiefly practised in ———, ——— ——— states.

(2) Well irrigation is mainly followed by farmers in ———, ——— ——— States.

(3) The highest dam of our country is ——— and the longest dam is ——— .

III. Match the following

	A		B
(1)	Sutlej	—	Mettur Dam
(2)	Mahanadi	—	Nagarjuna Sagar Dam
(3)	Cauveri	—	Bakra - Nangal Dam
(4)	Krishna	—	Hirakud Dam.

IV. Practical Work

(1) Undertake a tour to a dam site and examine its structure.

(2) Gather pictures of the important dams and paste them in your album.

(3) Mark on an outline map of India the states where the different types of irrigation are practised.

(4) Mark on a map of India the chief irrigation projects.

(5) Make a model of a dam.

5. AGRICULTURE

Food Crops, Commercial Crops and Plantation Crops

India is an agricultural country. Seventy percent of the people of our country are engaged in agricultural occupations. Agriculture provides all the food stuffs necessary for our life.

We get cotton for making our clothes and raw materials necessary for the industries by means of agriculture. Therefore agriculture is essential for the progress of a country. As the population of our country is steadily increasing year after year, we have to increase the food supply. Moreover our Government gets a large amount of its revenue from the cultivated lands of our country.

India occupies the first place in the World's production of *sugar* and *tea;* and second place in the production of *rice, jute* and *cotton.* It produces about 9% of the world's *wheat.*

Our country has all the facilities needed for agriculture. Here we have vast fertile plains, climate suitable for the growth of crops all the year, water

resources for irrigation, as well as factories for the production of chemical fertilisers and hydro-electric power in a large measure. In recent years, our government has largely improved agriculture by its Five Year Plans. Yet, when compared with the European countries, the United States of America, China and Japan, our country is still backward. There are many reasons for this backwardness. The cultivated land in India is divided into very small plots having hedges or fences. So, the use of modern machines for ploughing and harvesting is impossible. Our farmers, instead of adopting the new scientific methods of cultivation are still following the old methods; for example, many of them do not make use of chemical fertilisers and pesticides.

We may classify the agricultural crops grown in our country into the following three kinds:

(1) Foods Crops. (2) Commercial Crops and (3) Plantation Crops. Rice, wheat, cholam, cumbu, ragi, barley, pulses etc., are food crops. Cotton, sugar-cane, tobacco, jute, oil seeds are commercial crops. Coffee, tea, cocoa, rubber etc., are plantation crops.

Food Crops

Rice

The oldest known food crop is rice. It grows in the monsoon lands. It is the staple food for a large number of people of our country. For its cultivation, fertile alluvial soil, high temperature and heavy rainfall are required. In dry places irrigation is necessary. Rice is grown in Tamilnadu, Kerala, Andhra Pradesh, West Bengal, Bihar and Uttar Pradesh. It is

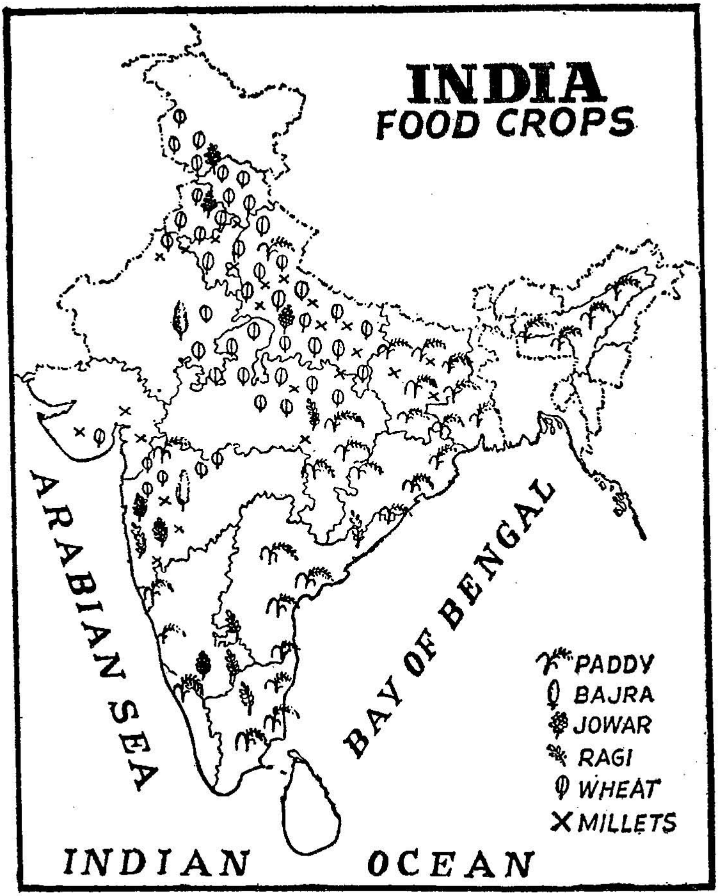

Fig. 28. India-Food Crops

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

The boundary of Meghalaya shown on this map is as interpreted from the North-Eastern Areas (Reorganisation Act, 1971), but has yet to be verified.

largely grown in the fertile river deltas of the East Coast of India and also along the West Coast. But yet, its production per hectare in India is very much less than in other countries. So every effort is made to increase its yield per hectare.

Wheat

Next to rice, wheat is the chief food grain. Wheat grows well in sand mixed alluvial soil. It also requires moderate temperatre and moderate rainfall. During the growing season a hot, dry weather, during ripening a warm, sunny weather and during harvest a dry weather is required. Wheat is cultivated in Punjab, Haryana, Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra.

Barley

Barley is a food grain like wheat requiring almost the same conditions as wheat for its growth. It is also used as food for cattle and horses. It requires moderate heat and fertile soil as it is a plant of the temperate zone. It is cultivated in the states of Punjab and Madhya Pradesh.

Millets

Cholam, cumbu, ragi, samai and varagu are the chief millets. They do not want plenty of water to grow. They are dry crops and they grow even in poor soil having a hot climate. They are cultivated in Tamilnadu, Karnataka, Andhra Pradesh, Maharashtra, Gujarat, Madhya Pradesh, Rajasthan and Punjab.

Pulses

Grams such as black-gram, bengal-gram, green-gram, peas, etc., are known as pulses. They are dry

crops but are very nutritious. Moderate heat and rain are enough to grow them. They are cultivated in Tamilnadu, Andhra Pradesh, Maharashtra, Gujarat, Madhya Pradesh and Uttar Pradesh.

Commercial Crops

Cotton

It grows well in black cotton soil. It requires a high temperature and moderate rainfall, well distributed throughout the period of growth Dry weather is required when the pod ripens and bursts. Cotton is of three kinds according to the length of its fibre: (1) short staple cotton, (2) medium staple cotton and (3) long staple cotton. The long staple cotton (cambodia cotton) has long, thin fibres suitable for making fine yarn, suitable for weaving high quality cloth. This kind of cotton is grown in Punjab, Haryana and Uttar Pradesh. Medium and short staple cotton are largely grown in India. Short staple cotton is used for making rough cloth. It is largely grown in north-west Deccan plateau, Gujarat, Maharashtra and Andhra Pradesh. Medium staple cotton is grown in the districts of Coimbatore, Madurai and Tirunelveli of Tamilnadu.

Jute

Jute is a fibrous plant. Fertile alluvial soil, high temperature and heavy rainfall are necessary conditions for its growth. Jute stalks are soaked in water for many days and then they are beaten hard to separate the long fibres from the pith of the stalks. The brown fibre is woven and made into gunny bags. Jute grows in plenty in the Ganges-Brahmaputra delta.

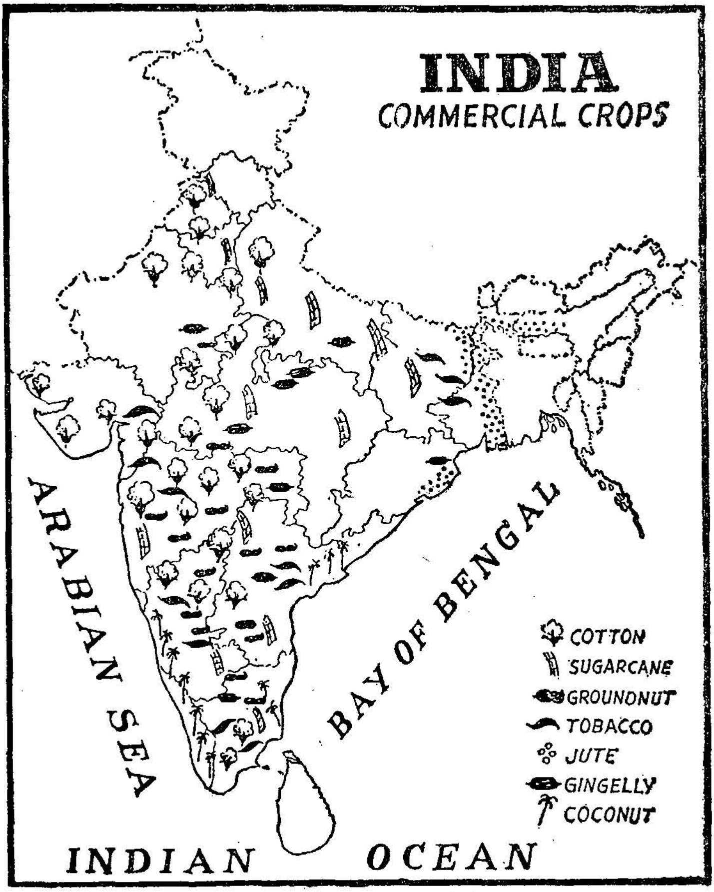

Fig. 29. India—Commercial Crops

The external boundary of this map is certified as correct by the Director, Map Publication Office, Survey of India, Dehra Dun, in his letter No. TB 532/62-A-4/339, dt. 5—2—1977.

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

It also grows to a small extent in Orissa, Bihar and Assam.

Sugar-Cane

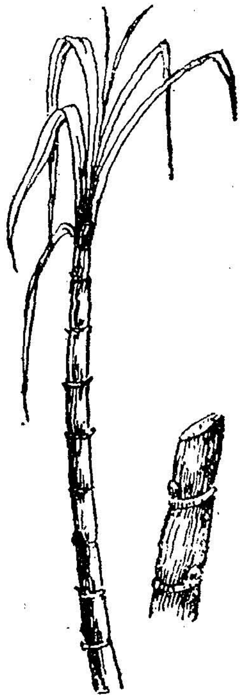

Fig. 30. Sugar-Cane

Sugar and gur are made from the juice of the sugar-cane. India produces the largest quantity of sugar-cane in the world. It grows well in alluvial soil. As it is a wet crop, it requires more heat and moderate rainfall. It is grown in the States of Tamilnadu, Andhra Pradesh, Orissa, Maharashtra, Uttar Pradesh, Bihar, Punjab and West Bengal.

Tobacco

Tobacco is the most common commercial crop. It grows very well in alluvial soil or black cotton soil. It requires much heat and plenty of water to grow and a dry climate for the leaves to become thick. The leaves are used in the making of beedi, cigar and cigarette snuff. Tobacco is grown in Andhra Pradesh.

Fig. 31. Tobacco Plant.

West Bengal, Gujarat, Uttar Pradesh, Punjab and Tamilnadu.

Oil Seeds

Edible oils are taken from groundnut, gingelly, castor, coconut, cotton seed, mustard seed, linseed and sunflower seed. Plenty of groundnut is grown in Gujarat and Tamilnadu. Coconut palms grow along the East and West Coasts of India. Oil is taken by crushing the 'Copra'. Gingelly grows in all the dry lands. Castor seed is grown with dry crops. Castor oil is used in medicine and industry. Andhra produces it in large quantities. Mustard is grown in the States of North India. In recent times the people have begun to use sunflower seed oil.

Spices

Pepper, ginger, cardamom, cloves, nut-meg etc., are called spices. Their use adds fine taste and flavour to food. They require much heat and rain to grow. They are grown along the slopes of the Western Ghats, Cardamom hills, Palani hills and Anaimalai hills. The spices are exported in large quantities to the western countries.

Plantation Crops

Tea

Tea is cultivated along the hill slopes. Even though it wants much rain water should not stagnate at its roots but be drained away. It grows well in red soil having plenty of rain and sunshine throughout the

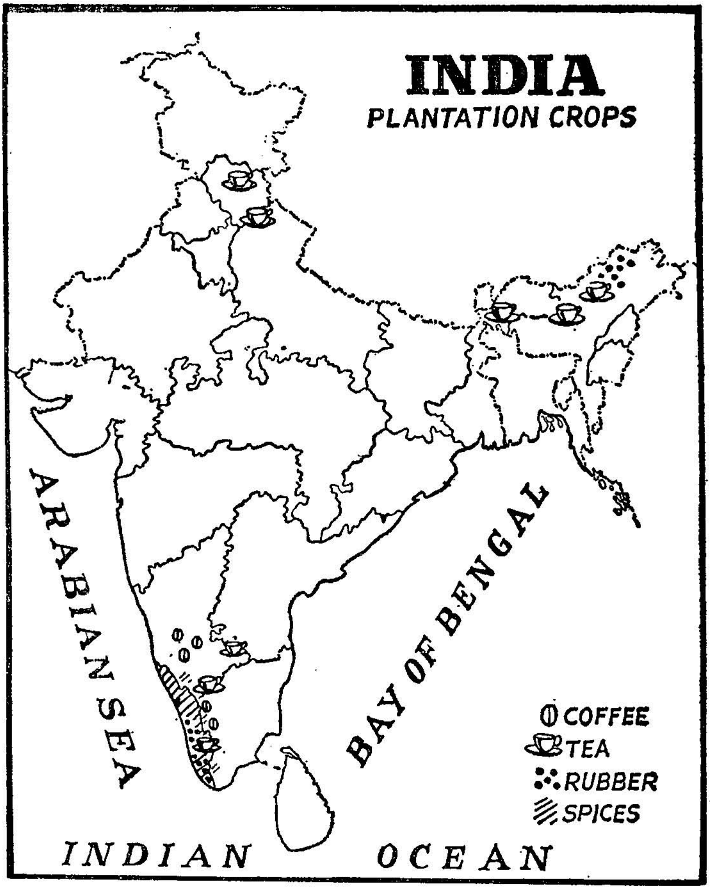

Fig. 32. India—Plantation Crops

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year. There are many tea gardens in Assam, and Darjeeling in West Bengal, the Nilgiris and the

Fig. 33. Plucking the Tea Leaves

Anamalais in South India. We export tea in large quantities to the foreign countries.

Coffee

This is also a plantation crop which requires fertile soil and a good amount of rain and heat. Like

Fig. 34. Collecting the Coffee Beans

tea, water should not stagnate at its roots, and as it wants shade, tall leafy trees which give shade are

also grown in coffee estates. Karnataka and Coorg, the Nilgiris, Shervaroys and the Anamalais and Palani hills in Tamilnadu have plenty of coffee gardens.

Rubber

The rubber tree grows in areas having fertile soil, much heat and rain. Lates or the rubber juice is taken by cutting the bark of the tree and hardened into

Fig. 35. Sapping the Rubber Tree

rubber. Rubber trees grow in the forests near Travancore in Kerala, on the Western Ghats in Tamilnadu, and in the islands of the Andamans and the Nicobars.

QUESTIONS

I. Answer the following questions

(1) Explain the importance of agriculture to our country.

(2) What are the problems faced by agriculture in our country ?

(3) What are the different types of crops grown in India? Give examples.

(4) What geographical conditions are necessary for the cultivation of rice? Mention the places where rice is largely grown in India.

(5) What are the conditions needed for the growth of wheat? Where is wheat largely grown in India?

(6) What are millets? Where are they grown?

(7) What are the commercial crops?

(8) What conditions favour the growth of cotton? Where is cotton largely cultivated in India?

(9) Mention the necessary conditions and the places where jute, sugar-cane and tobacco are grown.

(10) Mention the oil seeds grown in India. Mention also the places where they are grown.

(11) What are called spices? State the places where they are grown.

(12) What favourable conditions are required for tea, coffee and rubber to grow? State the areas where each is largely grown.

(13) What are the different types of cotton? State them.

II. Practical Work

(1) Mark on an outline map of India the places where the important crops are cultivated.

(2) Collect the agricultural produce of our country and name them.

(3) Visit the agricultural farms nearby and note the crops cultivated.

6. FISHERIES, CATTLE, AND POULTRY

Fisheries

The sea contains many kinds of natural wealth. From the sea we get fish, pearls and salt. Of them fish is the most important as it forms a source of food. Fish is also got from rivers, lakes and tanks. But a large quantity of fish of various kinds is got from the sea.

India has a long coast-line of about 6,000 km. long. But it is not broken by inlets. Fish live in large numbers on the continental shelf which extends into the sea for a few hundred metres. So fishing is carried on only in the shallow gulfs and backwaters along the coast. In spite of all this, fishing is not carried on widely in our country. But fishing is very important in the other parts of the world such as Japan, North-western Europe and along the coasts of North America.

Our land suffers from food shortage. Fish food is largely needed to make it good for it is highly nutritious.

Our fishing may be divided into three types :

(1) deep-sea fishing; (2) shallow coastal fishing and (3) inland fishing in the backwaters, rivers, lakes and tanks.

(1) **Deep-Sea Fishing:** Fishing in the sea beyond a depth of 200 m. is known as deep-sea fishing. For this purpose nylon nets and fast moving boats with cold storage chambers are needed. Fishing is carried on along the coasts of Gujarat, Konkan, Malabar and Coromandal. Indian salmon, eel, herring, mackerel, silverbar and sharks are caught in the deep sea. Norway and Japan help us in deep-sea fishing.

(2) **Coastal Fishing:** Fishing is largely carried on along the coasts of Tamilnadu, Andhra and Gujarat as well as along the Konkan and Malabar coasts and in the gulf of Mannar, and in the Chilka lake in Orissa.

(3) **Inland Fishing:** Inland fishing is so called because it is carried on in rivers, canals, lakes and tanks which are found in the interior parts of the country. Here fishing is carried on in the river Ganga and the Brahmaputra, the Mahanadi, the Godavari, the Krishna and the Cauveri as well as in the reservoirs across them.

Fish is used as a nutritious article of food. Fish oil is good for growing children and also for making soap and varnishes. Fish-bone is used in the manufacture of fertilisers.

Pearl Oyster fishing is a great industry at Tuticorin. Oyster fishing is also carried on largely in the Gulf of Cutch, Cochin and Tuticorin.

Deep-sea fishing stations are located at Bombay Mandavi, Mangalore, Cochin, Vizagapatnam and

Calcutta. Research is carried on in these places in the modern methods of fishing.

Cattle

The word cattle refers to sheep, goats, cows and bulls, buffaloes and swine as well as horses and asses. These animals are of great help in agriculture to the farmers. Bulls and he-buffaloes are used for ploughing and drawing carts; cows give milk; their flesh is also eaten; their excrete is used as manure; their hair, skin and bones are also used.

Bulls and Cows

Some kinds give good milk and some other kinds work very hard. For example, Sindhi and Mura buffaloes are famous for giving milk. Sindhi breed are found in Kathiawar; while the Mura buffaloes are found in Punjab, Delhi and Uttar Pradesh. Nellore breed of cows belongs to Andhra Pradesh while Hosur breed belongs to Tamilnadu. The bulls of the Kangayam breed of Tamilnadu and the Ongole breed of the Andhra Pradesh are hard working ones. There are veterinary hospitals all over the country to cure these cattle of their diseases. The Government is also interested in improving the breed of cattle.

Sheep and Goats

Sheep and goats are found in less rainy parts of India. Sheep are specially reared for their flesh and leather. Some sheep are reared for wool. They are largely found in Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, Andhra Pradesh, Karnataka and Tamilnadu. Goats are largely reared in the Deccan.

West Bengal and in Telingana of the Andhra Pradesh and in Orissa. The Kashmir goats yield very fine wool.

Poultry

Poultry farming is a profitable trade. We get good flesh and eggs from fowls and ducks. So, this has become a cottage industry in our country. Besides keeping the native fowls, the farmers also keep foreign breeds such as white leghorn, black minorca, rhode island etc. Their eggs are big in size and many in number. Large capital is not wanted to start a poultry farm. The Government also helps to start poultry farms in our country.

QUESTIONS

I. Answer the following questions

(1) Into how many kinds do we classify fishing? What are they?

(2) Name the countries where fishing is carried on in a large scale.

(3) State the places where deep-sea fishing is carried on.

(4) Mention the various uses of fish.

(5) Where are fish research stations located in our country?

(6) State the uses of cattle.

(7) Mention the chief breeds of cattle and the places where they are reared.

(8) What useful things do we get from sheep and goats?

(9) Where are large sheep farms found?

(10) Which fowls yield large number of eggs?

(11) How is poultry-keeping a profitable trade?

II. Fill in the blanks

(1) In our country deep-sea fish like ——, ——, —— are being caught.

(2) Pearl-fishing is carried on in ——.

(3) Sheep may be divided into ——, —— kinds.

(4) Very fine wool is got from sheep reared in —— State.

III. Practical Work

(1) Visit an aquarium situated near your town.

(2) Note the chief breeds of cattle found in a veterinary hospital or an agricultural farm.

(3) Visit a nearby poultry farm and learn the ways the fowls are fed and kept and the benefits derived from it.

7. MINERALS

Minerals are dug up from deep down in the earth. These minerals are necessary for the economic development of a country. Metals, petroleum and different kinds of salts are the common minerals.

Iron ore, coal, manganese, mica, bauxite, gypsum, monosite, petroleum are the minerals found in our country.

Iron

Iron is a very useful metal and so it is called '*black gold*'. Iron is found mixed with various other substances in the earth. So it has to be separated from them by melting it in blast furnaces. About $\frac{1}{4}$ of the world's supply of iron is obtained in our

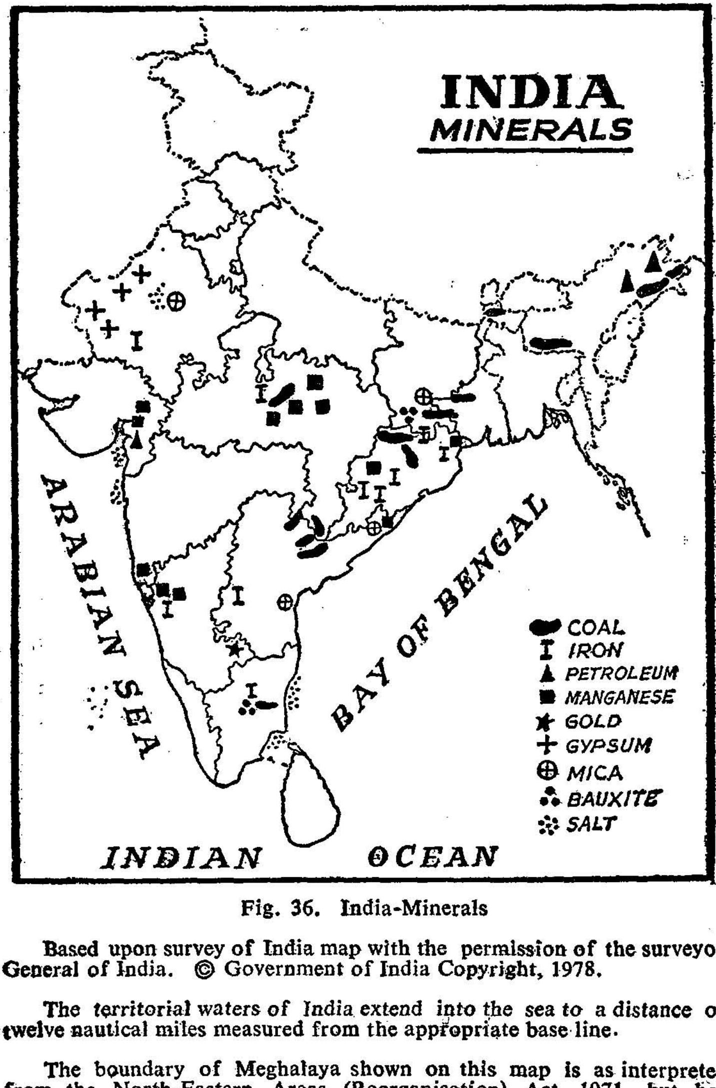

Fig. 36. India-Minerals

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

The boundary of Meghalaya shown on this map is as interpreted from the North-Eastern Areas (Reorganisation) Act, 1971, but has yet to be verified.

country. Iron mines are found in the district of Singbhum in Bihar, at Mayurbanj, Keonjar and Ponai in Orissa, in the Bababudan hills and Kudremuk in Karnataka, in the Nellore district of Andhra Pradesh, in Ratnagiri and Satraipur in the Maharashtra, in Bastar district of Madhya Pradesh and in the Salem district of Tamilnadu. Iron is used in the manufacture of various things, from a little nail to a big ship.

Manganese

Manganese is got in large quantities in India, next to Russia and South Africa. It is mixed with iron in making steel and in the manufacture of battery cells, glassware and chemicals. Manganese is found in the Palagai and the Sinduvara districts of the state of Madhya Pradesh in large quantities; in the Singbhum district in Bihar; in Srikakulam district of Andhra Pradesh; in the Nagpur district of Maharashtra and in the Shimoga district of Karnataka. Two-thirds of the manganese mined in India are obtained in the state of Madhya Pradesh.

Mica

India stands first in the production of mica. It is transparent and is not affected by heat or fire. Therefore, mica is used in blast furnaces, lamps, the front screens of motor cars, and in the manufacture of paper and varnishes and protective glasses. Mica is also largely used in aeroplanes and electrical instruments. Mica is obtained in the districts of Hazaribagh, Gaya and Monghyr in Bihar, in the districts of Udaipur and Jaipur in Rajasthan and in Nellore in Andhra Pradesh.

Bauxite

Bauxite is the chief mineral out of which aluminium is extracted. Aluminium is used for making household vessels and electrical goods. Large quantities of bauxite are obtained in the district of Ranchi in Bihar; in Kaira district in Gujarat; the Jabalpur district of Madhya Pradesh; in the Belgaum district of Karnataka and in the Shervaroy hills in Salem district of Tamilnadu.

Gypsum

Gypsum is used in the preparation of manure mixed with ammonium sulphate and in the manufacture of cement and paper. Gypsum is got in large quantities in Bikaner, Jodpur and Jaisalmar districts of the Rajasthan; in the Trichy district of Tamilnadu as well as in Uttar Pradesh, Kashmir and the Punjab.

Monosite and Ilmenite

These are very useful in the production of atomic energy. From these sands are extracted thorium and uranium. These minerals are obtained from the sea-sand near Travancore in Kerala and along the Coromandal Coast.

Salt

Salt is mainly used for adding taste to food and for preserving food materials. It is also used in preparing chemical salts. Salt is obtained from drying up sea water in pans near the sea shore in Gujarat, Maharastra, Tamilnadu, Andhra and Orissa states. Salt is also taken from lakes in Rajasthan called Sambhar and Didwana. Rock salt is obtained in

Mondi district of the Himachal Pradesh. Along the Tuticorin coast of Tamilnadu, salt is produced in large quantities. India exports plenty of salt to other countries.

QUESTIONS

I. Answer the following questions

(1) What are minerals? What minerals are found in our country?

(2) Where is iron ore found in India?

(3) Mention the places where manganese is found in India?

(4) Where is mica mined in our country? What are its uses?

(5) Mention the places where bauxite is got in our country and state its uses.

(6) Where is gypsum found? What is it used for?

(7) Name the minerals out of which atomic energy is produced. Where are they found?

(8) Mention the various methods in which salt is obtained and the places, where it is got.

II. Fill in the blanks

(1) Iron is also known as ———.

(2) India stands first in the production of ———.

(3) ——— is extracted from bauxite.

(4) Monosite and ilmenite are found in ———.

III. Practical Work

(1) Mark on an outline map of India the important places where the following minerals are found in large quantities: (a) Iron, (b) Manganese, (c) Mica, (d) Bauxite, (e) Monosite.

(2) Collect pictures of iron mines and paste them in your album.

(3) Gather samples of different kinds of minerals.

(4) Visit a mine near your town.

(5) Tour through districts where salt is gathered and note the method of obtaining it.

8. POWER RESOURCES

Coal, petroleum, electricity, atomic energy, natural gas etc., are the modern agents for generating power for industrial purposes. Hence a country's industrial development mostly depends on power resources available in that country.

Coal

Of all means of producing energy coal occupies the first place. Many millions of years ago large tracts of forests got buried during great earthquakes. These buried forest trees changed into coal under high pressure and great heat in the deep strata of the earth. Therefore, coal is nothing but the remains of many trees and plants. Coal is of three kinds : (1) Anthracite which gives great heat, (2) Bituminous which burns with smoke, and (3) Lignite or brown Coal.

Of these, bituminous coal is largely found in some parts of our country. Coal is mined in Raniganj and Asansol in West Bengal, Jariah, Gridhi and Bokaro in Bihar. There are also coal mines in Talcher and Rampur in Orissa; Umeria and Korba in Madhya Pradesh; in Kothakudam and Singareni in Andhra Pradesh and in Mahum in Assam State.

Lignite or brown coal is mined in Neyveli in Tamilnadu; a little quantity is also mined in Kashmir, Rajasthan and Bihar.

Uses

Coal is used to melt iron, to generate thermal electricity, to drive automative engines and steamships. It is also used in the preparation of coal gas and chemical manures. Tar, dyes, phenyle etc., are also extracted from it.

From the lignite of Neyveli house-hold fuel is prepared and also thermal electricity and chemical fertilisers are produced.

Petroleum

At great depths in the earth are found petroleum springs. It is brought to the surface by pumps inserted through the deep bores.

At Digboi and Mahum in Assam there are many petroleum wells. It is also got from the wells at Cambay and Ankaleshwar in Gujarat. After surveying the sea-bed along the coast, petroleum is also got near the city of Bombay under the sea.

There are many refineries to purify petroleum in our country. These refineries are in Barauni in Bihar, Nunmati in Assam, Trombay near Bombay, Manali near Madras, Cochin in Kerala and Vizagapatnam in Andhra Pradesh.

Kerosene, Diesel, Petrol etc., are obtained after purifying petroleum. Petrol is used for driving aeroplanes, motors and machinery. The by-products

made from petroleum are lubricants, vaseline, tar, wax, medicine and soap.

Hydro-Electric Power

Water stored up in dams built across the rivers or in large reservoirs or in natural water falls, is made to pass through penstock pipes and turn the wheels of a turbine engine and thus electricity is generated., This means of generating electricity is cheaper than the other methods.

The following are the important hydro-electric projects in our country like Bakra-Nangal project in Punjab; the Hirakud project in Orissa; the Kosi project in Bihar, the Damodhar project in West Bengal and the Koyna and Tata projects in Maharashtra. Similarly in Karnataka there are the Gersopa, Sharavati and Sivasamudram waterfalls schemes and in Andhra Pradesh there are Muchkund, Tungabadhra and Nagarjunasagar projects. In Kerala there are the Idukki and Cheyyar projects. In Tamilnadu hydro-electric power is supplied by Pykara, Kundah, Mettur, Periyar, Papanasam, Parambikulam and Moyar Schemes.

The above schemes depend on the supply of water and so cannot supply electricity at times when the mansoon rains fail. Then the help of thermal power station is required. Water and fuel are necessary for establishing these stations. In Tamilnadu we have thermal stations at Ennore, Neyveli and Madras; in Andhra at Kothagudam; in Gujarat at Dwaraka; in Uttar Pradesh at Obra; in West Bengal at Bundel; in Delhi at Indraprastham.

Atomic Power

Our Government has resolved to use atomic energy for peaceful purposes only. Thorium and Uranium are used to produce atomic energy. Schemes have been drawn up to produce more electric power through atomic power plants. Atomic power plants have been installed at Tarapur in Maharashtra at Rana Pratap Sagar in Rajasthan and at Kalpakkam in Tamilnadu.

Natural Gas

This gas is obtained from petroleum wells and taken to the refineries by means of iron pipes. Natural gas is obtained at Nagarkotia in Assam and at Jwalamuki in the Punjab.

QUESTIONS

I. Answer the following questions

(1) What are the means by which power is generated?

(2) How was coal formed in the earth?

(3) Mention the chief coal mines of our country.

(4) What are the different types of coal? Name them.

(5) What are the uses of coal?

(6) Name the important oil regions in India.

(7) Where are the petroleum refineries located in our country?

(8) How is hydro-electric power generated?

(9) Name the chief hydro-electric power stations of our country.

(10) Where are the thermal power stations situated in India?

(11) Mention the places where Natural gas is found.

II. Fill in the blanks

(1) Lignite is mined in large quantities in——.

(2) The cheapest means of producing electric power is ——.

(3) Thermal power is obtained from——.

(4) ——, —— minerals are used to produce atomic energy.

(5) Natural gas is obtained along with ——.

III. Practical Work

(1) Mark on the outline map of India the important places where coal and petroleum are obtained.

(2) Mark on the outline map of India the important hydro-electric and thermal power stations.

(3) Collect pictures of hydro-electric power stations of our country and paste them in your album.

(4) Visit a hydro-electric power station or a thermal power station and see how electricity is generated.

(5) Collect and keep bits of coal and lignite.

9. INDUSTRIES

The growth of Industries of a country mainly depends upon the availability of raw materials. Many different kinds of industries have sprung up in our country after independence and they have developed greatly during the past thirty three years. Remarkable advance has taken place in the iron and steel industry, cotton textile industry, sugar industry, chemicals, fertilisers, cement, motor cars, machine tools and ship-building.

Iron and Steel Industry

This is the most important industry and this is essential for the development of other industries. Iron and steel are necessary for the making of machine and machine tools used in all industries. Some of these are in the private sector and others are in the public sector. For example Tata Iron and Steel Company has been established by Jamshedjee Tata at Tata Nagar in South Bihar. We should know the reasons for itslocation in this region. The steel industry is generally found in places where iron and coal are available in plenty. Iron ore as well as coal, manganese and limestone are available in the neighbourhood of Tata Nagar. Electricity is also available in the neighbouring region. Jamshedpur is connected with Calcutta and other important towns by railways and roads which provide easy transport. Labourers are available in the neighbouring regions. Water is got for use in these factories from the river Swarnarekha. Big steel beams, wires, steel plates, rails, heavy machinery and agricultural implements are manufactured here.

The Badravathi Iron and Steel Works: This is situated in Badravathi in the Karnataka State. Iron ore and manganese are got from Bababudan hills and Shimoga. But coal is not available here. Therefore, charcoal obtained by burning the wood of forest trees, is used. But now the works mainly depend upon electricity produced at Jog Falls.

The Government of India gave much importance to the development of industries in Second Five Year Plan. It establish d three factories at (1) *Durghapur*, (2) *Bhilai* and (3) *Rourkela.*

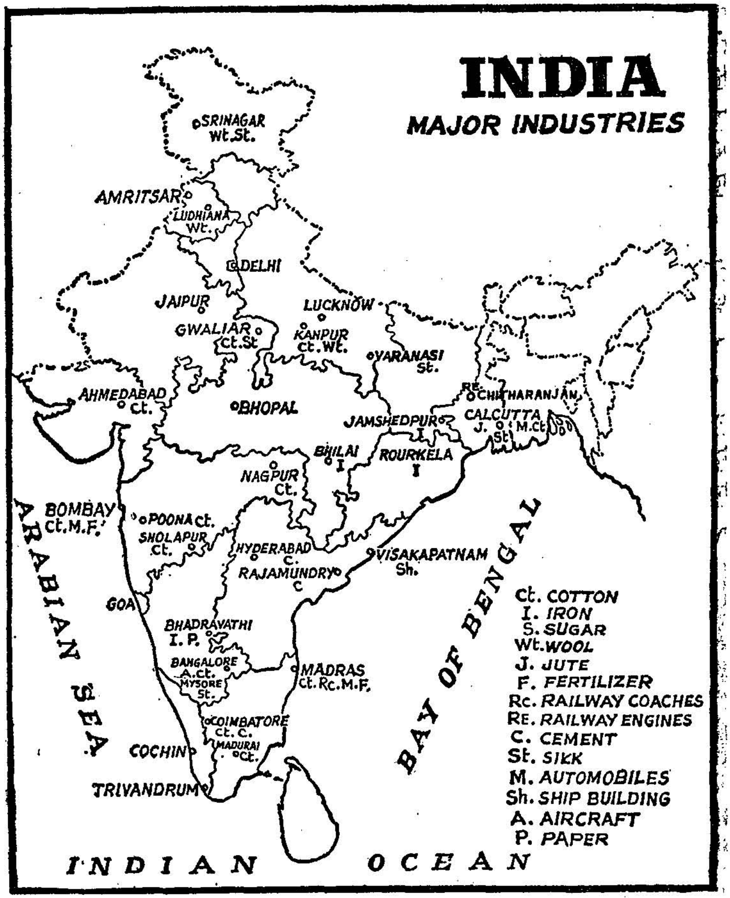

Fig. 37. India-Major Industries

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

The boundary of Meghalaya shown on this map is as interpreted from the North-Eastern Areas (Reorganisation) Act, 1971, but has yet to be verified.

The Durghapur Steel Plant: This is near Calcutta in West Bengal. The necessary iron ore is supplied from Giripuru in Orissa, coal from Jharia and electric power from the Damodhar River Valley project. Calcutta harbour serves as an outlet for its products. It has been established with the aid of *Great Britain.*

The Bhilai Steel Plant: This is situated in Bhilai in Madhya Pradesh. Plenty of iron ore, coal and manganese are available here. It has been established with the aid of *Russia.*

The Rourkela Steel Plant: This has been established at Rourkela in Orissa. Iron ore is got from Barsua, coal from Jharia and electric power from the Hirakud power station. This has been established with the aid of *West Germany.*

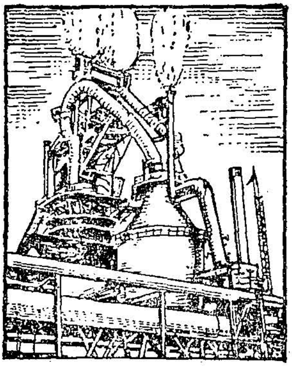

Fig. 38. Rourkela Steel Plant

Besides the above, another iron and steel factory has been set up with the help of Soviet Russia at Bokharo in the State of Bihar. The Government is planning to start iron and steel plants at Salem in Tamilnadu, and at Vizagapatnam in the Andhra Pradesh and at Goa.

Cotton Textile Industry

Of all industries, cotton spinning and weaving is very important. It employs thousands of workers. There are many cotton mills in the populous cities of Bombay, Poona, Ahamedabad, Sholapur, Nagpur, Kanpur, Calcutta and Coimbatore.

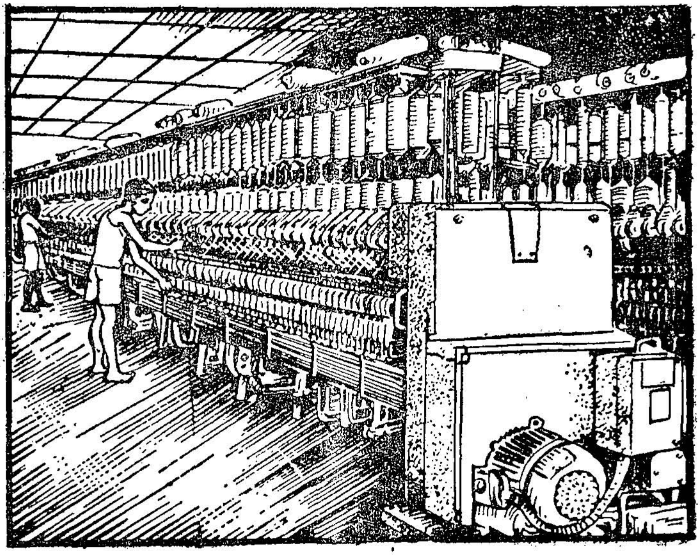

Fig. 39. A Cotton Mill

At Bombay there are a large number of textile mills. There are many reasons for this. Black cotton soil which is suitable for the growth of cotton is found around Bombay. So the mills easily get raw cotton. Electric power is got from the Tata Power House. As Bombay is a coastal town the atmosphere is moist and this helps to spin thin yarn. It is connected with all towns of India by railways and with foreign countries by sea routes. So Bombay imports machinery from Western countries and exports raw

cotton and cloth. Many rich men of Bombay have invested large amounts of money in this industry. Plenty of skilled labourers also are available. So Bombay is famous for its cotton industry and is called the "*Manchester of India.*" In South India there are many cotton textile mills in Coimbatore. So Coimbatore is called the *Manchester of South India.*

The Sugar Industry

The Sugar industry is well developed in India in recent times. Cane-sugar is largely manufactured in the states of Uttar Pradesh and Bihar. Hence, this region is called the *Sugar Belt* of India. Sugar factories are also found in the States of East Punjab, Maharastra, Andhra Pradesh, Karnataka and Tamilnadu. Kanpur, Meerut, Lucknow and Allahabad in Uttar Pradesh, Champaran and Muzaffarpur in Bihar, Pithapuram and Samalkot in Andhra Pradesh, Nellikuppam, Thiruvarur, Pugalur, Pettaivaithalai, Udumalpettai, Appakudal, Ambur, Maduranthagam and Pennadakam in Tamilnadu possess sugar factories.

Chemicals

This industry has developed very much in our country. Various kinds of chemicals are needed in the manufacture of other goods. Raw materials needed for chemical industry are coal, gypsum, bauxite, salts, limestone and ilumenite. Chemicals are used in the manufacture of fertilisers, leather, paper, gun-powder, paints and varnishes, plastics, glass, soap and acids. There are chemical factories in Bombay, Calcutta, Delhi, Kanpur, Madras, Bangalore and Hyderabad.

Chemical Fertilisers

Continuous cultivation of the fields makes them lose their fertility. So, in order to make them fertile, it is necessary to use artificial manure or chemical

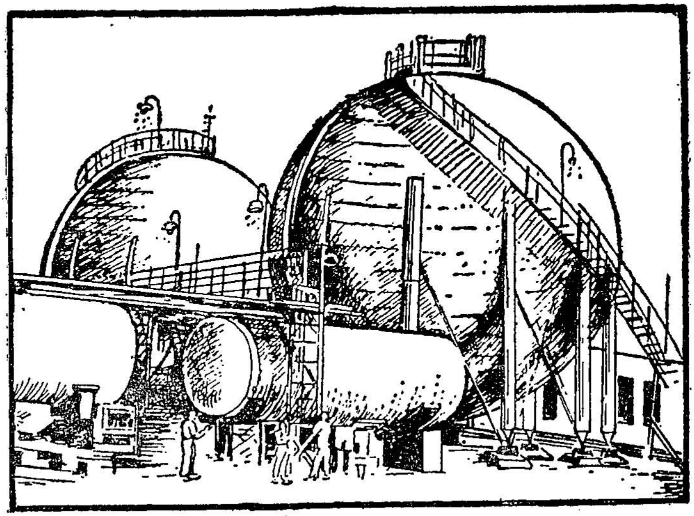

Fig. 40. Sindhi Fertiliser Factory

fertiliser like ammonium sulphate or super phosphate. The manufacture of fertilisers has developed after independence. Fertiliser factories are situated at Sindhri, Nangal, Trombay, Gorakpur, Durgapur, Alwaye, Neyveli etc.

Ship - Building

Ships are of much use to every country for foreign trade and protection against invasion by foreigners. Ship-building is carried on at Visakapattinam in our country. Visakapattinam has many advantages for building ships. It has a natural harbour near the deep

sea and so ships can be built and easily set afloat. It is between Madras and Calcutta sea ports and connected with them. Visakapattinam is well connected by railways. Coal from the Damodhar valley, iron from Tatanagar and timber from the forests of Chotanagpur

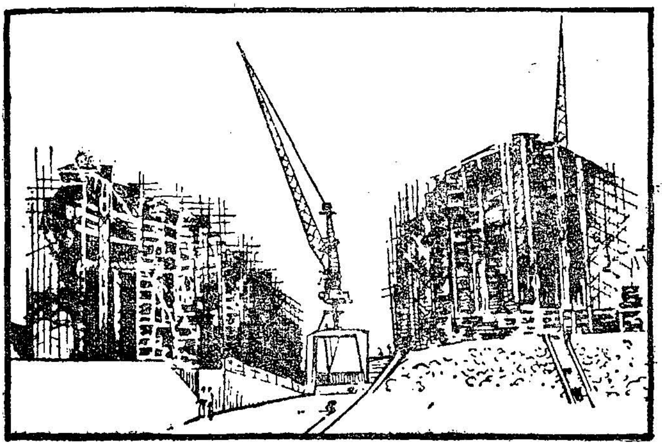

Fig. 41. Ship-Building Yard, Visakapattinam

plateau are easily brought to this place and the required machines are imported from foreign countries. Ships are also repaired here. The Government is also starting another ship-building centre at Cochin with the help of Japan.

Cement

Limestone, gypsum, clay and coal are the main raw materials required for the manufacture of cement. These are available in many parts of our country. So, cement is manufactured in almost all the states. Cement is largely used for building houses, bridges etç. Cement is produced at Sindhri in Bihar, Jabalpur

and Gwalior in Madhya Pradesh; Vijayawada and Hyderabad in Andhra Pradesh; Madukarai, Thalaiyuthu, Kallakudi, Sankaridurg, Tulukapatti in Tamilnadu, Bangalore in Karnataga, Raj Gangapur in Orissa and at Allahabad in Uttar Pradesh. Bihar occupies the first place in the production of cement and Tamilnadu, the second.

Manufacture of Motor Vehicles

Motor cars and trucks are necessary for the transport of people and goods from one place to another. Such motor vehicles as Ambassador, Standard, Fiat, Tata Benz, Dodge, Fargo and Leyland

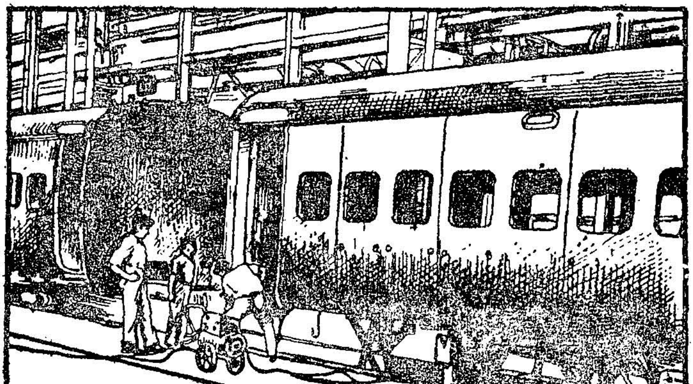

Fig. 42. Perambur Coach Factory

are manufactured in our country. Certain important parts of the machinery required for them are imported from foreign countries. Motor car factories are situated at Vandalur and Ennore near Madras. Railway engines are manufactured at Chittaranjan in

West Bengal and the railway coaches at Perambur, Madras. Tanks are made at Avadi near Madras. Bangalore has a telephone industry and an aircraft manufacturing factory. There is also a factory to produce Diesel railway engines at Varanasi.

Besides the above, there are many workshops which manufacture machine tools, scientific and engineering instruments and electric motors in several places. War materials and batteries are also manufactured in plenty. All these indicate that our country is fast becoming an industrial country.

QUESTIONS

I. Fill in the blanks

(1) ——, ——, —— are the places where iron and steel factories were established during the second five year plan.

(2) Bombay is known as the ——.

(3) The city of——is called the Manchester of South India.

(4) Diesel railway engines are manufactured at —— and railway coaches are manufactured at ——.

II. Answer the following questions

(1) What are the causes for the location of Tata iron and steel factory at Jamshedpur ?

(2) What reasons have led to the growth of cotton textile industry in Bombay ?

(3) Mention the places where sugar factories are situated in Tamilnadu.

(4) Name the important places where chemical fertilisers are manufactured.

(5) How is Visakhapattinam a suitable place for ship-building ?

(6) Name the raw meterials required for cement. Mention the places in Tamilnadu where cement factories are located.

III. Practical Work

(1) Prepare an album of pictures showing iron and steel factories, cement factories and ship-building yard.

(2) Visit a factory near your locality.

10. POPULATION

The area of India is 3.27 million square kilometres. At present the population of our country is about 650 millions. The census is taken once in every ten years. In 1961, the population was 440 millions. In 1971, it increased to 547 millions. This means that in ten years, the population has increased by 24.80%. In 1981, it is expected that the population of India will be 700 millions. The most populous country in the world is China. India stands next to China. About 1/7 of the people of the world live in India. The number of persons living in the area of 1 sq. km. is known as the density of population. The density of population in India is 221 persons per sq. km.

Uttar Pradesh is the *most largely populated state* in India. The other populous states are Bihar, Maharastra, West Bengal, Andhra Pradesh, Madhya

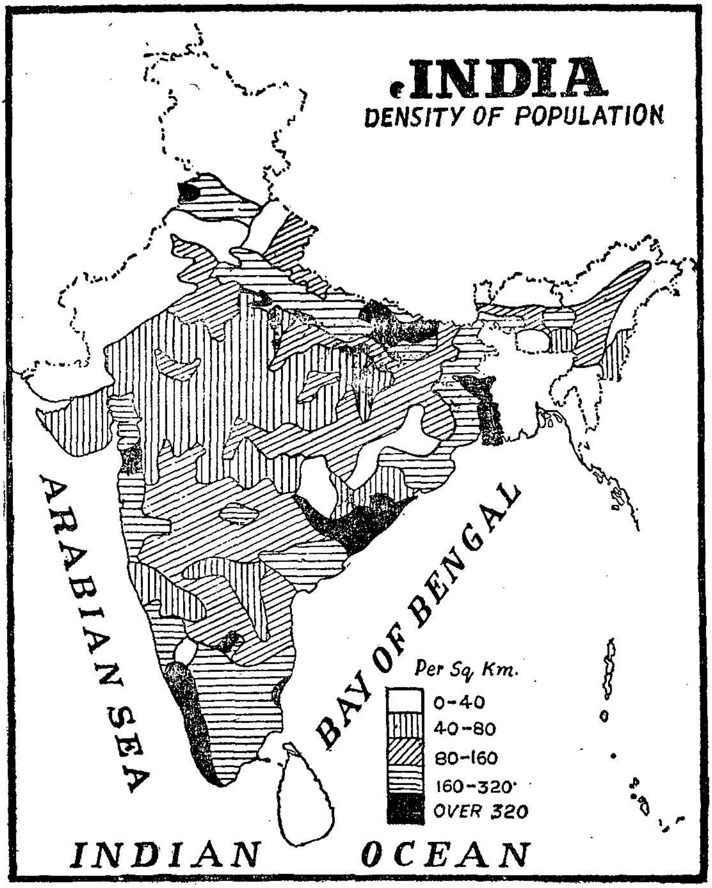

Fig. 43. India—Density of Population

The external boundary of this map is certified as correct by the Director, Map Publication Office, Survey of India, Dehra Dun, in his letter No. TB/532 62-A-4/339, dt. 5—2—1977.

The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

Pradesh, Tamilnadu, Karnataka and Gujrat. Such large population is the result of fertile soil, equable climate, agricultural and industrial progress and good transport facilities. In our country, Kerala is the most *densely populated state*. Its density of population is 554 persons per sq. km.

The thickness of population in our country is greater in big cities which are very few in number. For example, the population of cities like Calcutta, Bombay, Delhi, Madras, Ahamadabad, Nagpur, Hyderabad and Bangalore is fairly greater. This is because they have better prospects, facilities and opportunities.

The Government is now trying to stop the migration of the people from villages to cities, by improving the facilities and the employment opportunities in villages.

The sparesly populated states in India are Rajasthan, Kashmir, Himachal Pradesh and Assam. Rajasthan is a hot desert; Kashmir and Himachal Pradesh are mountainous and very cold; Assam is mountainous and receives very heavy rainfall; and all these states lack in transport and industrial facilities. So they are sparesely populated.

About 80% of the people of our country live in villages and their main occupation is agriculture. About 138 million hectares of land in India are under cultivation. Our Government has improved agriculture by its four Five Year Plans and is adopting measures to improve further. As a result of it, our country has become self-sufficient in food production.

To-day we are not importing food grains from other countries. Yet, we have to meet the demands of the growing population of our country. We should curtail the rapid growth of population and bring it under control. Only then, our standard of living will improve and our country will progress in all fields.

In order to put under control the growth of population our Government has introduced the Family Planning Scheme. Generally the uneducated people do not adopt the Family Planning schemes. So, the Government is trying its best to spread literacy.

Both the Central and State Governments are trying to improve the living conditions of the poor and reduce the growth of population.

QUESTIONS

I. Fill in the blanks

(a) The area of India is ——— sq. km.

(b) The largely populated country in the world is ———.

(c) Nearly 80% of the people of our country live in ———. Their main occupation is ———.

(d) The most largely populated state in India is——— and the most densely populated state is ———.

II. Answer the following questions

(1) What is the present population of India?

(2) Which are the states having large population? Give reasons.

(3) Mention any four populous cities of India.

(4) Account for the high density of population in big cities.

(5) What are the reasons for the rapid growth of population in India? What steps are taken by our Government to control it?

(6) Name the states which are sparsely populated. Give reasons.

III. Practical Work

Mark on the outline map of India the most populous and less populous states. Use different colours.

11(a). TRANSPORT

Transport facilities are very essential for a country's progress and economic development. People need proper means of transport to move from one place to another, to bring the raw meterials to the manufacturing centres, to carry the goods to the trading centres, and to move the army during war. Let us read in this lesson the different means of transport and how they connect the ports and big cities.

The means of transport can be classified into four kinds. They are *roads, railways, waterways* and *airways.*

Roads

The length of roads in our country is about 9.6 lakh kilo metres. These roads can be divided into four classes.

They are : 1. National Highways, 2. State Highways, 3. District Roads and 4. Village roads.

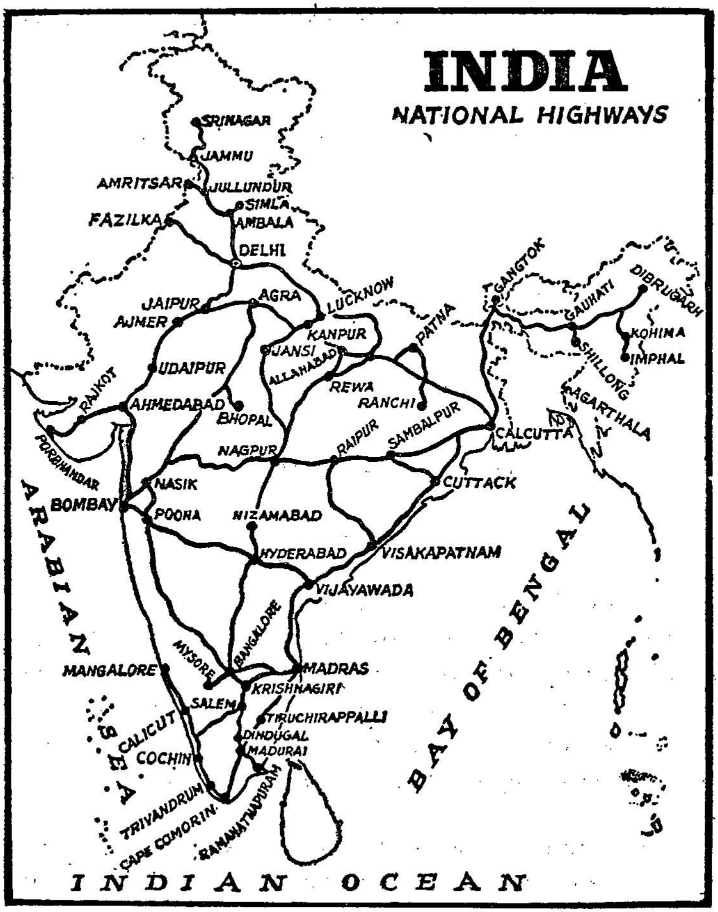

Fig. 44. India-National Highways

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

The National Highways are under the control of the Central Government while the State Highways and other roads are repaired and maintained by the State Governments. The National Highways connect the state capitals and sea ports of our country. Some important National Highways are :

1. From Calcutta to Pathankot through Varanasi, Kanpur, Delhi and Ambala.
2. From Madras to Calcutta through Vijayawada.
3. From Madras to Bombay through Bangalore.
4. From Bombay to Delhi through Agra.
5. From Calcutta to Bombay through Nagpur.
6. From Madras to Delhi through Nagpur.
7. From Varanasi to Cape Comorin through Nagpur, Hydrabad, Bangalore and Madurai. This is the longest National Highway.

The state and the district highways connect the manufacturing towns and market centres and railway junctions. The village roads are intended for the use of the villagers. The roads in the frontier districts are useful for protecting our borders. Our Government has spent about Rs. 162 crores in the first three Five Year Plans to lay new roads. In recent years roadways have improved much in our country.

Railways

The total length of railways in our country is about 60,070 km. They are under the control of the Central

Government. They carry passengers and goods from place to place. There are three different gauges of railways namely (1) Broad gauge (1.65 m), (2) Metre gauge (1 m) and (3) Narrow gauge (0.75 m). Now steam engines are gradually replaced by Diesel and Electric engines.

For convenience of administration our Indian railways are divided into nine Zones. The administrative headquarters are established in one of the chief towns for each Zone. They are as follows :

	Zones		Official Headquarters
(1)	Southern Railway	—	Madras
(2)	South-Central Railway	—	Secunderabad
(3)	Central Railway	—	Bombay
(4)	Western Railway	—	Bombay
(5)	Northern Railway	—	Delhi
(6)	North-Eastern Railway	—	Gorakhpur
(7)	Eastern Railway	—	Calcutta
(8)	South-Eastern Railway	—	Calcutta
(9)	North-Eastern Frontier Railway	—	Pandu

Railways are laid largely in densely populated regions, plains and industrially advanced regions. The major sea ports of India such as Bombay, Calcutta, Madras are connected by railways with the Capital of India, Delhi. Some important rail routes are given below :

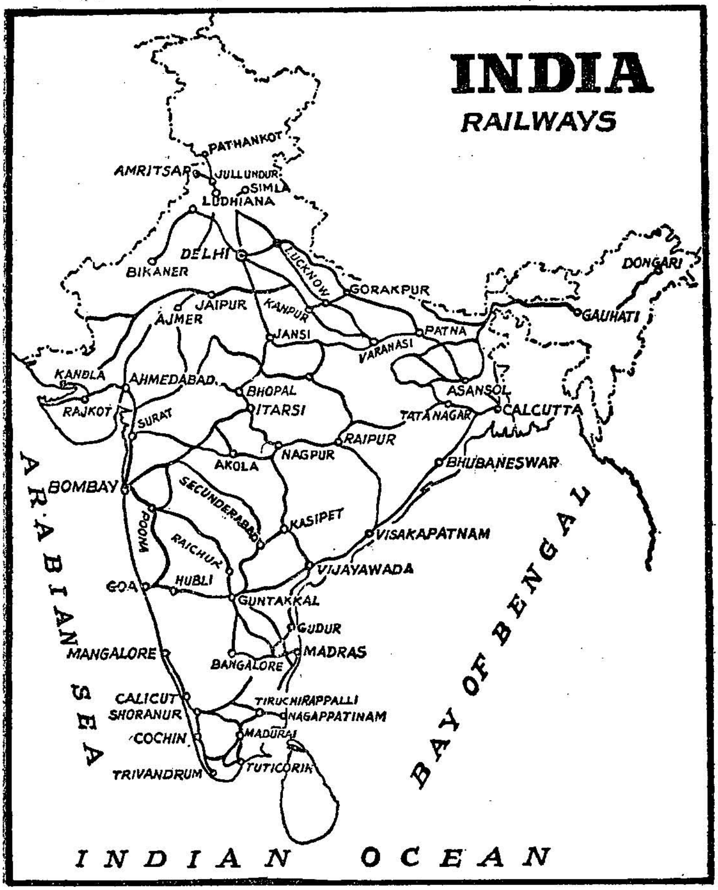

Fig. 45. India-Railways

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

Railway		Important Junctions
(1) Madras to Delhi	—	Vijayawada, Nagpur, Bhopal, Jhansi, Gwalior, Agra.
(2) Madras to Calcutta	—	Vijayawada, Waltair, Cuttack, Gorakpur.
(3) Madras to Bombay	—	Guntakal, Raichur, Sholapur, Pune (Poona).
(4) (a) Madras to Trivandrum—(Broad Gauge - Main line)		Salem, Coimbatore, Shoranur, Ernakulam, Quilon.
(b) Madras to Trivandrum—(Metre Gauge - Chord line)		Cuddalore, Thanjavur, Thiruchirapalli, Madurai, Thenkasi, Quilon.
(5) Madras to Mangalore	—	Salem, Coimbatore, Shoranur, Calicut, Cannanore.
(6) Madras to Tirunelveli	—	Thiruchirapalli, Madurai, Virudhunagar.
(7) Delhi to Calcutta	—	Agra, Kanpur, Allahabad, Benares, Patna.
(8) Delhi to Bombay	—	Agra, Jhansi, Bhopal, Baroda.
(9) Bombay to Calcutta	—	Nasik, Nagpur, Raipur.

Our Government has spent nearly Rs. 200 crores in the first three Five Year Plans to develop the railways.

Waterways

Waterways are generally cheaper than railways. But compared to other means of transport they are

slow. We can divide waterways into two kinds: 1. Inland waterways; 2. Sea routes.

The total length of our Inland waterways is about 14,150 km. They include rivers, canals and back waters. Navigation by boats and small ships are possible in these waterways. Inland trade is widely carried on by them. They are used to transport heavy goods to a shorter distance at a cheaper rate.

The following are the important inland waterways:

(A) In the Ganges river — from Calcutta to Buxar

(B) In the Brahmaputra — from the delta region to Dibrughar

(C) In the Narmada, Tapti, Mahanadhi, Godavari, Krishna and the Cauvery navigation is possible only during the rainy season.

(D) The Ganges Canals from Haridwar to Kanpur.

(E)	The Buckingham Canal	From Marakkanam in South Arcort District (Tamilnadu) to Betha Kanjam in Krishna District (Andhra Pradesh).
(F)	The back waters	Between Cochin and Quilon.

There is a large trade by sea along the coasts of India. Small steamers are used in this trade. The sea-routes along the west coast of India connect the ports of Bombay and Cochin; and along the east coast connect the ports of Calcutta, Vizagapattinam, Madras and Tuticorin. The big ships in the sea - routes to foreign countries pass through the Suez Canal to Europe; Via the Cape route to South Africa and Western Africa; and via Singapore to China, Japan, Australia and New Zealand.

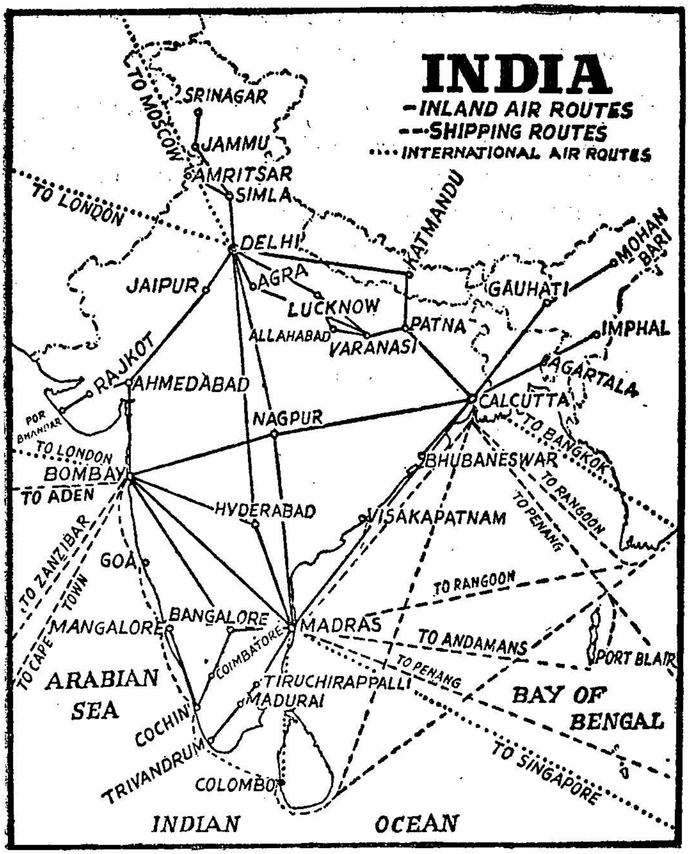

Fig. 46. India-Sea and Air Routes

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The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.

In India ship-building has been undertaken by the public and private sectors. There are nearly 150 minor ports and 10 major ports in India. As the big ports are connected with the foreign countries, there are possibilities for the development of foreign trade in India. As the penninsula of India is situated in the centre of the Indian ocean, it helps to trade with the foreign countries.

Airways

Airways are very useful for carrying passengers and postal articles very quickly to distant places. The airways of India are entirely managed by the Central Government. The *Indian Airlines Corporation* manages the inland airways while foreign airways are managed by *Air - India International.* The important cities of India are connected together by internal air routes while foreign countries are connected with India by external air routes. Note these important air routes in the map.

There are 85 air ports in India; of them the international air ports are Santa Cruz in Bombay, Palam in Delhi, Dum Dum in Calcutta and Meenambakkam in Madras. Our Central Government has spent nearly Rs. 75 crores for the development of Airways during the last three Five Year Plans.

QUESTIONS

I. Answer the following questions

(1) Explain the need for transport to a country. Mention the different kinds of transport.

(2) How many kinds of roads are there? What are they?

(3) What are National Highways? Mention the important National Highways of our country.

(4) How many Railway Zones are there in India? What are they? State their headquarters.

(5) Mention the important inland waterways in our country.

(6) What are the four main sea routes of India? Name the countries connected by each of them.

(7) How are the inland and foreign airways managed?

(8) Mention the four important international air ports of our country.

II. **Practical Work**

(1) Mark the important National Highways of our country in an outline map of India.

(2) Mark on the outline map of India, the following rail routes with two important junctions:

(a) Madras—Delhi

(b) Madras—Calcutta

(c) Madras—Bombay

(d) Madras—Trivandrum

(e) Madras—Mangalore

(f) Madras—Tirunelveli

(3) Mark on the outline map of India the following air routes with important intermediate airports:

(a) Madras—Delhi

(b) Madras—Bombay

(c) Madras—Calcutta

(d) Madras—Trivandrum

(e) Madras—Cochin

(f) Bombay—Calcutta

11(b). TRADE

EXPORTS AND IMPORTS

Trade includes both inland and foreign trade. Inland trade refers to the sale of goods manufactured in India within the country. Foreign trade means the sale of goods of other countries in India and the goods manufactured in India sold in other countries. If goods manufactured in India are sent to other countries, we call them *exports.* If goods manufactured in other countries are brought to our country, we call them *imports.*

The progress and prosperity of a country depend upon its foreign trade. The country which manufactures and exports valuable goods on a large scale to other countries is considered to be a prosperous one. When the total value of goods exported from a country is greater than the total value of goods imported, it is said to have a *prosperous foreign trade* (a favourable Balance of Trade). Therefore our present trade policy is mainly concerned with decreasing of our imports and increasing of our exports. Thus, we aim at earning a lot of foreign exchange. In order to improve our foreign trade our Government is trying to increase our agricultural and

industrial production. It is also trying to increase the production of raw materials and develop sea-ports and transport facilities. It finds out the needs of other countries and tries to raise its industrial production. As a result of this policy India occupies the sixth place in foreign trade in the world.

Exports

Tea, coffee, rubber, tobacco, cotton goods, oil seeds, leather goods, sugar, spices, cashew nut, mica, manganese, iron ore, iron and steel goods, sewing machines, electric fans, cycles, railway coaches, chemicals, plastic goods, medicines etc. are the goods largely exported. They are being exported to United States of America, Canada, Great Britain, Russia, West Germany, African Countries, Japan, Australia and Sri Lanka.

Imports

Goods imported to India from other countries are machinery, petroleum, tanning materials, raw cotton, dye-stuff, automobile spare parts, paper, chemicals, wool, medicines, books etc. These are imported to India from Great Britain, West Germany, Russia, United States of America, Canada, Egypt, Australia, Japan etc. India imports petroleum largely from the countries of South West Asia, raw cotton from Egypt, Kenya, Sudan and United States of America and some chemicals from the United States of America, West Germany, Great Britain and Japan.

Our foreign trade is largely carried on through major ports as *Kandala*, *Bombay*, *Marmagoa*, *Cochin*, *Tuticorin*, *Madras*, *Vizagapattinam*, *Paradeep* and

Calcutta. These sea ports are well connected by railways and roads with trading centres and industrial towns found in their hinterlands.

QUESTIONS

I. Answer the following questions

(1) Explain what is meant by inland trade and foreign trade.

(2) What do you mean by import and export?

(3) Explain the importance of foreign trade to a country.

(4) What are the articles exported from India and to which countries are they exported?

(5) What are the imports of India? From which countries are they imported?

II. Practical Work

Mark on an outline map of India the major sea ports.

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